THE MEANING OF RATIONALISATION

BY THE SAME AUTHOR

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THE MEANING OF RATIONALISATION

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PREFACE

IN May, 1927, the League of Nations assembled at Geneva a World Economic Conference representative of employers, employed, and economists. The work of the Conference was largely carried out by means of two committees, one dealing with commercial and the other with industrial questions. Among its other activities the Industrial Committee produced a series of resolutions under the title of "Rationalisation" which were finally adopted by the Conference as a whole.[1] These resolutions recommended "that Governments, public institutions, professional and industrial organisations, and the general public should influence producers to direct their efforts along the channels described . . . and diffuse in every quarter a clear understanding of the advantages and obligations involved by Rationalisation and Scientific Management, and of the possibilities of their gradual application."

In Great Britain a small group of employers had already taken certain steps to promote both in their own factories and among their fellows a wider appreciation and application of scientific methods of management, largely through an organisation for mutual co-operation and study in circles of

[1] See Appendix A. Resolutions of the World Economic Conference, Geneva, 1927, on "Rationalisation."

non-competing undertakings known as Management Research Groups This group felt that the opportunity presented by these authoritative resolutions should not be lost Having ascertained that it was at the time improbable that any department of the State would take the initiative suggested by the Conference, they decided to see what could be done by voluntary effort

They realised immediately that one of the chief difficulties in their path issued from the existing complexity of the organisations designed to assist industry or those engaged in industrial management in various specialised directions Many great departments of state already exercised functions bearing upon the economic life of the nation They included the Board of Trade, the Home Office, the Ministry of Health, the Ministry of Education, and the Ministry of Labour In addition there were a variety of special bodies maintained by the Central Government Among them may be mentioned the Department of Scientific and Industrial Research, with its dependent Trade Research Associations and special laboratories, the Industrial Fatigue Research Board, and the Empire Marketing Board

Voluntary institutions of various kinds presented an even more complex picture In almost every trade were organisations of employers and employed heading up to great national federations such as the Confederation of Employers Organisations, the Federation of British Industries, and the Trade Union Congress While the object of such organisations was primarily political and economic influence, they had in practice developed many subsidiary services to their members bearing on the questions in-

cluded under the heading of "Rationalisation" by the World Economic Conference. There were research agencies either founded by trades on their own initiative or connected with educational establishments. There was a network of professional institutions who were inevitably compelled to consider the relationship of their members and of their special work to the general structure of industry. There were many undertakings founded to promote the application of some particular idea within the general field of Rationalisation—standardisation, psycho-technology, co-partnership, welfare, safety, and so on.

This situation had undoubtedly produced in the individual employer a certain impatience with new organisations. Owing to the rapid technical development of modern business methods, a development with which his methods of organisation and administration had not always kept pace, he found himself confronted with a large number of new activities somewhat outside the daily routine of his own undertaking. Conscious that failure to maintain contact with them might result in a loss of initiative and knowledge of value to his concern, he was at the same time aware that many of them were the product rather of enthusiasm than of practical experience. His time and his personal power of absorption were alike limited. Consequently he tended to regard with very definite suspicion any proposal to add to their number.

Two things were clear. The complexity of the existing institutions and their predominantly specialised character largely concealed the essential unity of the problem with which they were designed to deal.

A definite movement for Rationalisation could only be founded on a policy which regarded the industrial life of the country, and the various aspects of management which were united in each separate industrial undertaking, as a whole On the other hand, the employer, the individual in whom these multiple tendencies and activities met, as it were, at a point of action, could view with legitimate apprehension any attempt to add to the number of organisations and institutions Without him any movement of opinion or ideas would fail of practical result But his support on a large scale could only be anticipated if a more coherent and logical arrangement of the various specialised activities were presented for his co operation, an arrangement definitely calculated to save him time and money In short, the first requisite in Great Britain, if any national movement for Rationalisation was to be initiated, was some more rational arrangement of the existing forces dealing with one or other aspect of the total field *Mutatis mutandis*, the same condition holds good for the majority of industrialised countries

Accordingly, those concerned called a meeting of the officials of some fifty institutions to consider the possibilities of co-operation That meeting appointed a committee of seven members, with power to add to their number, to consider the situation The Committee included the Directors of the Federation of British Industries, of the British Engineering Standards Association and of the National Institute of Industrial Psychology, the Professor of Accountancy and Business Organisation at the London School of Economics, the Secretary of

the Incorporated Association of Retail Distributors, and the Honorary Secretary of the Management Research Groups.

In examining the situation, the Committee concluded at an early stage that the number of institutions concerned was greatly in excess of those already consulted. From the point of view both of the employer and of the possibility of further collaboration, the first essential was a clear account of the existing activities and organisations arranged in a convenient form for reference. This work would obviously require considerable research; and for this arrangements were made. The results are to be published in the form of a handbook providing a Directory of the various institutions in Great Britain whose work is designed to contribute to industrial efficiency.

During the course of this work it became obvious that a great deal of misunderstanding existed both as to the scope and significance of the term Rationalisation itself, and as to the character of the contribution to be made, by the various forms of specialised activity, to the industrial situation viewed as a whole. Some more general account of the whole matter, viewed from this angle, was required. Originally it was intended to incorporate this account in the proposed handbook in the form of an introduction. But as opinions and knowledge of the subject developed, it seemed undesirable to do so, both on the ground of length, and because the study necessarily touched upon controversial and speculative questions with which the Committee, in its official capacity, did not wish to deal.

It was therefore decided to ask a single member of the Committee to use the material which had been prepared for this purpose, and to publish a monograph on the subject of Rationalisation on his own authority Hence this book.

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THE MEANING OF RATIONALISATION

CHAPTER I

HISTORY AND DEFINITION

THE term "Rationalisation" is at present little understood. There are as many definitions and interpretations as there are individuals who use the word.[1] This is not surprising, for it has had a chequered history. It was originally used by Psychologists. In this branch of science it is a technical substantive, describing the process by which individuals discover logical reasons after the event for actions which are really dictated by instinct or other unconscious motives.

In the economic field it was first employed by the Germans. After the war there was great confusion in the business life of Germany. Powerful leadership was essential; at the same time there was considerable prejudice against the formation of Trusts. Both at this period, and after the stabilisation of the Mark, the men who came to the front as the leaders of German industrial life wanted a new phrase to describe the general process of re-organisation and unification which they were

[1] See Appendix B. Some Definitions of Rationalisation.

applying They evolved the term "*die Rationalisierung*" Since important features of this process were the grouping of individual businesses in large combinations and the elimination of inefficient producers in order to balance supply with demand, 'Rationalisation" has been understood by many individuals in this sense only Force has been given to this interpretation as far as Great Britain is concerned, by Lord Melchett The most distinguished industrial leader who has used the word —he has applied it almost exclusively in this connection [1]

At the same time this use of the term gave an incomplete view of the underlying ideas which inspired the economists and industrialists who had built up the new economic order in Germany The Reichskuratorium fur Wirtschaftlichkeit (Board of National Efficiency), the co ordinating body established by the German Government to guide the national effort in this direction, published the following definition

> Rationalisation consists in understanding and applying every means of improving the general economic situation through technical and systematic organisation Its object is an increase in the standard of living by the provision of better and cheaper goods in larger quantities This demands a common effort by all classes of the community"

As an English observer of German opinion has recently stated, "to understand rationalisation, one must think primarily, not of self-contained estab-

[1] See Appendix B

lishments, but in terms of a whole industry, whether organised as a trust or on a co-operative basis, or nationalised. It is not necessary to trustify an industry to rationalise it, nor is it necessary to eliminate completely all forms of competition, or to destroy altogether the management and administrative autonomy of particular undertakings."[1]

Positively, as well as negatively, the commonly-accepted English view did less than justice to the width and force of the German movement. For instance, in their inquiries into improved methods, the Reichskuratorium and its allied institutions, relied almost exclusively upon the voluntary services of employers and managers. Over 6,000 highly paid individuals gave their time freely to the work of the many specialised committees engaged in guiding and inspiring German industrialists towards national reconstruction. The enthusiasm and self-abnegation enlisted in support of the general movement were directly comparable to the state of mind of British employers during the closing stages of the war.

In France, contemporaneously with the German development, the conception of "rational" had been attached to a somewhat different movement. In the United States the idea of applying the scientific intellectual technique to the problems involved in the control of a single factory had been initiated by F. W. Taylor. He had described his ideas under the generic title of Scientific Management. This movement found its most appreciative and distinguished expression in Europe among a group of French engineers, among whom le Chatelier and

[1] Walter Moakin: *The New Industrial Revolution.*

de Freminville were the most important Lacking any exact equivalent in the French language for the word "Management," they had rendered Taylor's phrase by the expression "l organisation scientifique du travail"

In France, as in America, there was a reaction against the tendency to apply Scientific Management, due to the same reasons—premature and partial attempts to use certain methods employed by Taylor without an adequate understanding of his fundamental ideas, and above all, inadequate explanation to those concerned of the significance and purpose of changes which were introduced This re action tended to concentrate on the word scientific The majority of mankind is still too close to animistic superstitution and emotional beliefs, too fond of a miracle, to regard men who have begun to think scientifically save with considerable apprehension They are thought to be in some way inhuman, because in a particular field they have sacrificed the blurred edges of imagination for the sharp finality of facts Faced with this very natural development of atmospherics, the French engineers took to using the phrase "l organisation *rationnel* du travail"

This was the position when the World Economic Conference met at Geneva in 1927 This great international gathering of representatives of the employers, of the workers, and of economists of all schools of thought, appointed a committee on industry This committee had two definite tasks It was faced with the manifold and complex problems of the world economic situation It had to evolve and to state a policy designed deliberately to give

an impetus to production and to restore the balance of those basic industries, such as textiles and coal, which had suffered an interruption of their normal economic development owing to the disturbances of the war and post-war period. At the same time it sought to express in this policy the new attitude towards international affairs, economic as well as political, which had made possible the foundation of the League of Nations, and the calling of the very Conference of which it was a part. It had to think and speak with an international mind, from the angle of world interests, rather than with a view to the sectional advantage of any particular nation or group of nations. It was not a diplomatic or bargaining body. It was a planning body. It was charged with the objective examination of those factors in the economic thought and development of all nations which, vigorously applied in practice, might lead to a general recovery of prosperity.

A detailed examination of the whole field had formed part of the preparatory work for the Congress. The documentary studies collected by the economic machinery of the League formed a review of world business movements such as had never previously been brought together. And just as the Conference itself was a unique and unprecedented occurrence, so, too, this mass of evidence revealed a hitherto unsuspected process of change in the angle of approach to economic questions.

The change may be described broadly as a world-wide inclination to recognise that, not only actual scientific discoveries, but the mechanism of thought evolved by the physical sciences, might be applied

to the solution of business problems with far reaching results Economic enterprise appeared to be feeling its way towards new forms of organisation designed to secure greater stability and security through a more exact adjustment of efforts to need (Movements of demand and supply, recurrent cycles of activity and depression, were no longer regarded as inevitable natural phenomena) Rather they were viewed as manifestations of social purpose, definitely susceptible to control by co operative action based on a scientific examination of all the facts involved

This movement displayed itself in a wide variety of undertakings and at every level of economic life The outstanding developments noted by the committee were

(*a*) The application of physiology and psychology to the working life of the individual whether in the home, in agriculture, in commerce, or in industry

(*b*) Research along similar lines into corporate activities and bearing on such questions as wage payment systems, profit-sharing and co partnership, industrial relations, and other methods of collaboration

(*c*) The attempt to provide a scientific foundation for the technique of production by a wider use of the physical sciences, chemistry, physics, mineralogy, mathematics, and so on, which bear on the materials and processes of industry

(*d*) The endeavour to apply the same lines of thought to the more general technical pro

blems involved in the control of the single business enterprise, such as lay-out, transport, accounting, office methods, planning, routing, marketing, and the like . . . generally described by the phrase "Scientific Management."

(*e*) Efforts to improve the General Organisation of Production and Distribution on national and international lines by elimination of waste, simplification and standardisation, horizontal and vertical combinations, industrial agreements, action by Goverments and Public Services, and by organisations of employers and workers, mass production and distribution, forecasting of business movements, and by the statistical study of the general world conditions bearing on these issues such as the supply of raw material and of labour, markets, transport, and power.

The characteristic which inspired and was common to these developments was the belief that a more rational control of the economic life of the world was possible and desirable, and that it could be achieved by a close application of the discoveries, and of the intellectual methods and standards of science, to the whole of the problems involved.

Seeking for a single term which should express this general attitude towards economics and include the whole of the various developments which it had noted, the committee adopted the word "Rationalisation." It will be noted that this use included both the different meanings in which it had previously been employed. In a remarkable

series of Resolutions it emphasised the advantages to be gained by every party to industry from their resolute application to all the problems involved in production and distribution As indicated in the Preface to this book, it urged their adoption on Governments, industries, and the general public These Resolutions, which were practically unanimous, were accepted by the Conference as a whole in its concluding session [1]

The general definition established by the Conference read mildly enough "Rationalisation, by which we understand the methods of technique and of organisation designed to secure the minimum waste of either effort or material They include the scientific organisation of labour, standardisation of both materials and products, simplification of processes, and improvements in the system of transport and marketing"

Two special points may be noted in connection with it The phrase "scientific organisation of labour" is a literal and mistaken translation of the original draft which was in French The French words "l'organisation scientifique du travail" have a well established technical significance and should have been rendered in the English version by "Scientific Management" The further resolutions make it clear that the conference included in the phrase "scientific organisation of labour" those studies of individual and collective psychology calculated to produce worthy conditions of work and of life both within and without the factory.

More generally, there is no question that its phrases indicated a revolution in world economic

[1] See Appendix A

thinking—a greater revolution than has yet been fully appreciated. Ever since manufactured power was applied to the driving of machines there has been a tremendous increase of material production throughout the western world. But, broadly speaking, the economic theory to which men have turned to regulate that great increment of activity and complexity has been comparatively simple and elementary. This is particularly true of the thinking of the men in power, the active business venturers who have been engaged in the controlling and directing tasks of the great adventure of modern trade.

That theory is described variously as Individualism, Capitalism, Laissez-faire, the Economics of Private Enterprise, and so on. It has many ramifications. But its broad outlines are sufficiently well known. It postulates that the sole significant motive force which can be relied upon to maintain the organisation of the world's necessary supply of goods and services is the desire of the individual for gain or acquisition. The main purpose of the State in relation to economic life is to achieve an uninterrupted field for the operation of that motive by establishing security of property in the gains achieved by business activity. The only force necessary to adjust the actions of the individual to the community's good is the influence of the competitive re-action of those individuals upon each other in their common pursuit of wealth.

Regarded objectively, the dominance of this theory over European thinking during the last hundred years has been amazing. In practice it has been violated a thousand times, because it has issued in

social conditions which have been found intolerable, and have led inevitably to the intervention of the State in the interests of public order Business men themselves have constantly sought to evade the full re actions of competition by trusts, combines, price arrangements, and similar devices Here again the State has intervened to protect the individual regarded as a consumer But on the whole the theory has prevailed as the basic thought of men on this matter—an assumption that the great complexity of effort necessary to maintain the world's material life cannot be organised, is beyond the control of any form of positive corporate action which humanity can devise

Faced by a constant succession of booms and slumps, huge losses of capital owing to ill organised or excessive production, desperate poverty and unemployment despite its increasing capacity for technical improvement, our industrial civilisation has continued to assume that the forces of competition were a sufficient governor for the economic machine Where explanations have been sought and given, they have been phrased in terms of "economic laws," assumed to operate as inevitably as those laws of nature which science has so far revealed In short, in economic matters the modern world has acted much as its mediæval ancestors acted with regard to thunderstorms or other natural phenomena which they did not understand They have attributed the various vicissitudes to which they were subjected to "some god or other" . in this instance a deity which they called Competition

The persistence of this method of thinking was due in the main to two causes In the first place

much of the criticism directed against the current economic disorder was in the same plane as the theory by which it was justified. Curious alliances were formed. Trade Union leaders who had recruited a million men behind them by the successful negotiation of bargains about wage rates and the businesslike administration of insurance benefits, were found hand in hand with socialist thinkers who condemned the acquisitive motive as wholly vicious or denied its existence altogether. The majority of the critics could not refrain from the characteristic human tendency towards witch-burning. At a period when the ownership of capital was becoming more and more widely distributed, and in many instances more clearly divorced from the actual exercise of administrative functions in economic life, much of the difficulty was attributed to the machinations of non-existent bogies, called Capitalists.

In the second place the existing situation corresponded to a large degree with the social prejudices inherited by those in positions of power and authority in Europe. These prejudices were traditional, handed down from feudal times. They envisaged the community as divided naturally into classes, aristocracy, bourgeoisie, and workers. It has needed the influence of a new industrialised community founded on a democratic model to suggest that the market for goods must depend on the amount of money made available as earnings, in short that the "iron law of wages" was in reality only the expression of certain social preconceptions. As yet the full significance of this tendency has not been realised. But it is at least beginning to suggest

itself to certain business circles that organised prosperity can only be founded on an increasing margin of expenditure available to the community as a whole

The ' Rationalisation" resolutions of the World Economic Conference indicated a revolution in world economic thinking, because for the first time they challenged this general theory of economics from a practical standpoint The Conference itself worked in the best traditions of modern economic thought It was inductive, not deductive It took the facts, the experiments, the movements that have been mentioned, bearing on almost every phase of economic life at almost every plane of organisation It formed no theory But it did what had never been done before in an authoritative form it synthesised and fused those facts into a single conception Consciously or unconsciously it presented them to the world no longer as experi ments carried out in isolation, but as parts of one whole—the first signs of a definite human effort on a national, and also on an international scale, to take charge of economic destiny, to direct it deliber ately for the common good

The significance of its attitude is clear The various movements which it considered and recom mended to attention had each their own special contribution to supplement the older views of competition. They did not condemn competition on principle and as a whole Between individuals, business concerns, industries, and nations, com- petition had secured flexibility and initiative, stimulated personal efficiency in certain instances, and provided an invaluable means of determining

relative values. But they represented a definite modification of the older view that it was self-regulating, and that it automatically adjusted supply to demand in such a way as would secure the best interests of the consumer. They admitted that in operation unmodified competition was in fact slow in its effect, and a temptation to short, as opposed to long, views. Thus it might re-act on the individual producer in low wage levels and adverse working conditions inimical to his total economic potentiality, on the individual business unit in uneconomic prices and rapid changes in the levels of value, fatal to planned and ordered production, on industry and trade as a whole in undue complexity of product and rapid alternations between boom and slump, destructive of economical operation and of the security of industrial capital. Whatever the immediate advantage to the consumer in lowered commodity prices, he had, ultimately, to pay for these wastes. The problem of an ordered economic progress was the problem of eliminating the wastes while at the same time retaining all the advantages inherent in the existing economic system.

Further, the Resolutions re-stated the avowed purpose of economic activity in no uncertain form. Under the older economic theory the practical and theoretical importance of the motive of acquisition had led to some curiously confused thinking on this point. The money economy was so general and so closely connected with this motive that in the business world as a whole there had arisen a confusion between mechanism and purpose. Despite the theoretical economist who stated quite clearly that money was only the medium of exchange, that

is to say a convenience, a device, the majority of business men were inclined to exalt it into a first principle, to make it an end in itself They would say that "the purpose of business was to make *money*" *Any more logical view of the case was* dismissed contemptuously as sentimental

But the defined end of Rationalisation is to secure "the minimum of waste" The definition of the Reichskuratorium already quoted is in terms of an "improved standard of living" The Economic Conference resolutions speak of gaining "to the community greater stability and a higher standard of life" These phrases cannot be evaded They are a clear admission that, whatever form of organisation we may accept as the most practical for the time being, there is a purpose in industry and commerce beyond and above the profit of particular business enterprises Our economic machinery exists not to enrich individuals—that is incidental—but to serve the community

Finally, in the methods which they recommended, the Resolutions carried a further implication F. W. Taylor, when asked to define Scientific Management, used to say, "it is a mental revolution" He meant that it could not be defined in terms of method alone it involved also a new attitude of mind It meant that the methods developed over a century of industrial life by rule of thumb and tradition could not, for that reason, be accepted without question The whole situation in any undertaking, in any trade, must be re-examined, with the detachment from preconceptions, the intellectual technique, and the integrity to truth of a worker in the exact sciences

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That conception as to method underlies both the definitions which we have quoted. Rationalisation is not merely a new view of economic theory or a new set of methods or systems. It involves a complete change of attitude on the part of all those who work in business, a new spirit. It demands a fresh vision, not only of the purpose for which business exists, but also of the means of examining and solving, in the light of that purpose, all the countless problems which arise in the course of business activity. There must be a change both of the technique, and of the scale, of thought. That change must embrace not only the matters from the least to the greatest which arise in the day by day conduct of business enterprises. It must go beyond the individual concern to the trade or industry, beyond the trade or industry to those other groups with which they are associated as producer or consumer, beyond that again to their relationships with the structure of the national economic life, and finally to those international relationships whose organised conduct we have but recently begun to contemplate.

It is with these meanings, implicit in the Resolutions of the World Economic Conference, and as expressing this new approach to economic questions, that the word "Rationalisation" is used throughout this book. It may be defined either as an attitude or as a process. As an attitude it records *the belief that a more rational control of world economic life through the application of scientific method is possible and desirable.* As a process it implies *the application of the methods of science to all problems arising in the organisation and conduct of production, distribution, and consumption.*

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CHAPTER II

SCIENTIFIC METHOD

IF we accept the definition given in the previous chapter, it becomes clear that the conception of Rationalisation covers a very much wider field than has yet been touched by the actual movements to which the World Economic Conference called attention Before considering in detail the content and importance of these movements, the full possibilities and extent of that field must be examined

In the first place the phrase "Scientific method" may be expanded The scientist faced with any problem works by certain definite steps First of all he collects all the data available bearing on the question at issue Secondly he observes such data and the general situation with a view to discovering whether he has omitted any facts which are pertinent to his inquiry He then proceeds to define the terms which he employs He then subjects this collection of data expressed in defined terms to analysis, that is to say he arranges and groups his facts in a convenient form for the purposes of his inquiry He applies to those facts such standards of measurement as he is able to devise He is then in a position to undertake actual experiments designed to throw further light on one or other aspect of his investigation In making each ex-

periment he will always endeavour to isolate the single factor on which he is working so as to avoid inconclusive results. The evidence which he accumulates by this process may place him in a position to formulate definite principles or laws. Such principles or laws he will put to further test both by actual experiment expressly designed for the purpose or, where this is not possible, by further observation of phenomena which he subjects to the same process of definition, analysis and measurement. He will accept as proven only such conclusions as are capable of repeated proof by these means, and even here he will only regard such conclusions as provisional and subject to revision in the light of further fundamental discoveries. It may be noted, for instance, that within the last few years Einstein's work has largely changed the whole basis of our knowledge of physics.

The scientist only proceeds to an examination of the unknown on a basis of present knowledge which is, as far as possible, complete. Applying this principle to business, it necessarily involves in all decisions a full use of existing discoveries in the exact sciences. As far as such sciences deal with the external world, their potential application to industry is already largely admitted, though the practical measures designed to bring them into play are often neither complete nor well devised. Such sciences are chemistry, botany, biology, astronomy, mathematics, and so on. They actually impinge upon economic life in a series of applied sciences such as engineering, industrial chemistry, metallurgy and mineralogy, agricultural botany, meteorology, statistics, and so on. A second great group

of departments of organised knowledge deal with man himself They include physiology, psychology, biology, and bio-chemistry They again issue in an applied form under the titles of medicine, industrial psychology, industrial hygiene, and sociology

Pure research in all of these sciences is constantly proceeding, and leads to a progressive enlargement of the boundaries of knowledge In many cases business has already contributed largely to the promotion of such research Men of vision have realised that only by enlarging the area of understanding on which the applied sciences are based can they hope to increase their command of the materials and processes on which industry and commerce depend

What is less generally appreciated is the possibility of using the second group of sciences which we have mentioned in dealing with the human problems raised by our economic civilisation, problems which indeed must prove incapable of solution except in the light of more exact knowledge It is not suggested—it would be misleading to suggest—that the sciences which bear upon human nature have yet reached a stage of development in which they can be adopted as a certain guide in all varieties of social action It has recently been calculated by a leading investigator in bio-chemistry that 200 years will be needed before our knowledge of the physiology and chemistry of the nervous system is sufficient to provide a secure foundation for experimental psychology. At the same time, it is clear that the younger sciences bearing upon human nature have already placed at the disposal of the industrialist a wealth of provisional con-

clusions which are far more likely to be accurate than the guess work or personal opinion which have hitherto formed the basis of our economic action in such matters.

Where, however, decisions have to be taken in regard to which there is no certain ground-work of exact knowledge to which they may be referred, it is still possible to apply the intellectual technique of the scientist which has been described. Such a procedure will not, indeed, remove all elements of fallible human judgment from the processes of solution, but it will secure that such judgment is largely cleansed of those emotional and personal elements which are most likely to lead to error, and is based on a consideration of the available facts which refers to the real problem at issue rather than to the sub-conscious promptings of some individual whose interests are involved.

In this connection, moreover, experimental science has already provided the business man with certain recognised instruments which may assist in this process. These include a very definite range of statistical conceptions which may be used for the measurement of certain forces and tendencies where human beings are involved. The graphic presentation of series of facts in the form of charts and diagrams is an invaluable aid to their more correct appreciation. Various forms of statistical and other controls have been carried over from the practice of science to the solution of business difficulties.

It will be seen, therefore, that the use of "scientific method" does involve an approach to a large range of economic problems very different from that which is at present the common practice in

everyday life The majority of business questions are at present decided by reference to standards of existing practice which have been gradually made available as the result of unrelated efforts and to experience which has not been submitted to any exact analysis or standards of measurement The competitive theory which has formed the basis of our economic life during the past century has itself effectively prevented that free exchange of knowledge between business men engaged in similar tasks which could alone provide sufficient data for a scientific examination of their activities

In addition, the rapid evolution of our machine industry and the ruthless character of a competitive economy have placed a premium upon qualities of personal forcefulness which are in direct opposition to the intellectual humility essential for real scientific work The typical "captain of industry" has been a man who dominated situations rather than a man who was prepared to submit himself to the inexorable logic of facts The necessities of his position have forced him on countless occasions to insist on the importance of his personal experience, rather than to admit both to himself and to others the necessary limitations in space and time of any single individual's contacts with reality In short, if a test is required as to whether any individual is or is not seized with the scientific standpoint, it may be found in his habitual method of expressing himself in relation to business decisions· the man who has ceased to talk about "my experience" and is beginning to talk about "my experiments" is at least beginning to understand the full significance of the scientific approach

CHAPTER III

THE SCOPE OF RATIONALISATION

RATIONALISATION not only involves a complete reversal of traditional mental attitudes on the part of all those who are engaged in economic life: it also touches every form of activity in which that life is manifested.

Both historically and in order of process, the basis of all economic life is, of course, agriculture. Scientific experiment is daily widening our knowledge of the botanical and climatic conditions most favourable to successful plant cultivation. The breeding and feeding of animals is being steadily improved by specialised work on processes and methods determined by exact experiment, rather than by tradition and individual experience. Less well-known are the results of certain studies which have been made on the physical movements involved in various classes of agricultural labour. Here again large economies have been made possible by the elimination of rule-of-thumb methods. Fertilisers, rotation of crops, methods of grading and marketing farm produce, the storage, packing and preservation of foodstuffs, are all subjects of specialised scientific study.

In this field we are only at the beginning of our experiments. The conditions of comparative isolation in which the farmer and small-holder necessarily

work, and, in many countries, the traditional independence of the agriculturalist, has made it extremely difficult to disseminate and realise in practice the discoveries already recorded by workers in laboratories and on experimental farms But there is no question that as means can be found for increasing genuine effort and for giving wider effect to the knowledge already accumulated, the productivity and the certainty of results from agricultural work can be enormously increased, despite the fact that this branch of economic life is necessarily influenced more than any other by climatic uncertainties which have as yet escaped human control

Most closely allied to agricultural production of all types are the extractive industries concerned with the initial transformation of the raw materials provided by nature Here again the progress of knowledge is along diverse lines In the first place the actual methods of extraction of the basic material concerned are constantly being improved, so that the process is more economical, and the yield is higher Secondly, the human effort required per unit of production is in process of reduction in many directions, by the substitution of mechanical devices, by the application of more refined methods of applying each unit of labour, and by the elimination of occupational inconveniences and risks concerned in this class of work Thirdly, the yield of useful products per unit of basic material extracted is subjected to progressive refinement It is only necessary to mention processes for the low-temperature carbonisation of coal, for the diffusion of precious elements from the slag

left after the extraction of nickel, and the continuous improvements in the methods of breaking down crude oil. Finally, more accurate grading of the product of such industries resulting in the establishment of recognised standards of quality has done much already to facilitate the marketing of their output. Their integral connection with manufacturing industries involves them in a chain of operations where large-scale and well-planned facilities for continuous processing can effect economies amounting to many hundreds per cent, economies designed to re-act not only on the extractive industries themselves, but on all those further economic activities which are dependent on them for power, light, and other facilities.

What is true of the extractive industries applies, *mutatis mutandis*, to all groups of manufacturing industry from the greatest to the least. Here the problem of the elimination of waste presents itself most immediately in the form of the improvement and integration of mechanical devices. The physical sciences are daily securing to the employer a better technical control alike of his raw material and of the processes by which it is manufactured. This is only the beginning of the application of science to the problems of such industries. On the managerial side the increase in efficiency to be obtained by greater attention to modern principles of organisation, to costing, planning, routing, office methods, statistics, and other refinements of control, have been amply demonstrated. Similar results have been obtained in connection with marketing, selling, advertising, and financial forecasting. The problems which arise under all these heads are

as susceptible to research and experiment as are the problems of chemistry or metallurgy

Turning from the production of goods to their distribution, we can find a vast field for the exercise of more rational methods. Indeed, many students of the subject are convinced that it is in this direction that the largest wastes in our present economic system are to be found Already in the United States of America the existence of an ample domestic market, coupled with the problem of great distances, have given an impetus to experiments in methods of distribution which may well revolutionise our practice in this respect The arrangement by which the manufacturer sold his product to a wholesaler or agent, who again distributed it either through a further wholesaler or direct to a retailer, who finally passed the goods to the consumer, has already been modified in many directions The necessities of modern large scale production and competitive demands for immediate delivery, have forced the manufacturer to secure for himself more stable and reliable markets than could be obtained through fortuitous purchasing by the wholesaler. This has led to more scientific study of the actual demand for his goods expressed in the buying capacities of the final consumer, to campaigns of national advertising, to the branding and packaging of proprietary goods, and in certain cases to the combination of retail and manufacturing activities While the small retail establishment is still dominant in the field of distribution and may yet have a long and useful service to perform, it is clear that the individual retailer cannot command those specialised services which are available to larger undertakings

This difficulty may be overcome by forms of co-operation between individual retailers, but these are as yet comparatively undeveloped.

In the meanwhile the larger department store has gained much ground owing to its concentration on management, publicity, statistical control, and the convenience which it can offer from the point of view of the purchaser. It has been followed by the chain of shops which combine the advantages of specialisation in one branch of trade with large-scale buying and the possibility of standardized comparison of experience. Signs are not lacking that the chain of department stores will provide a further economic refinement which combines the advantages both of the department store and of the chain store.

In all these distributive activities scientific method may be applied to the actual goods purchased, displayed, stored, packed and delivered to the consumer, and can yield vast economies in all the processes of human labour involved in these transactions, from those of the salesman at the counter to the statistical controls employed by the Managing Director. As in the case of the manufacturer, the wholesaler or retailer can refine his knowledge of the actual direction of consumer demand, the factors which determine changes of fashion, and of the other psychological causes which determine whether his customers shall be few or many.

What is true of production and distribution is equally true of those ancillary financial activities so vital to economic life. In banking, scientific method may be applied first of all to the actual problems of organisation involved in the many transactions

with which it is concerned; accounts, cash payments, credit transactions, correspondence, records, may all be conducted with a decreasing margin of waste. They resemble closely the problems of production in a factory concerned with the manufacture of a large number of detailed articles. Human effort may be made to yield a larger return both by the application of mechanical devices, and by improvement in systems and organisations.

Secondly, a wider knowledge of scientific method will greatly clarify the banker's estimate of credit risks. The normal financial and personal factors which have formed the basis of decisions on such matters in the past present an incomplete picture of the potentialities of a modern business. They are more inclined to reflect past records than future possibilities. Accurate diagnosis of the health of a business depends on a close understanding of its total balance of productive efficiency, market opportunities, and financial and managerial resources. (Rationalisation methods provide means of expressing these symptoms both briefly and accurately.) It is inevitable that in future the banker will insist on a closer examination of such indicators.

If we turn from banking to the money market as a whole, we find the beginnings of an attempt to gain control of those general movements of prosperity and depression which are so great a factor of uncertainty in business undertakings. This movement is the general outcome of the application of more refined statistical methods to business problems. Less than half a century ago a leading economist seriously propounded the theory that

(cyclical fluctuations of trading activity might be definitely correlated with the appearance and disappearance of sunspots.) To-day, while the fundamental causes of these waves of depression have not yet been fully explained or analysed, there is an increasing tendency to assign them to movements of general opinion which can be modified and brought under some degree of control by wider knowledge. The isolation of particular factors which serve as indices to these business tendencies and their presentation in statistical form have already made considerable progress. This new science of "business forecasting" as it is called, already provides business men and financiers with some warning of possible general tendencies which enables them to take counter-measures. This fact in itself, and still more the growing conviction that the cyclical movements of trade are not entirely inflictions of nature, but the results of human action, are sufficient to modify their incidence and the severity of their results. The effect of this new knowledge on the operations of the money market, on our views about unemployment, on the wider use of general statistical material, and on the control of currency and credit facilities is already considerable.)

The final stage of the economic process is that of consumption, the actual purchase and use of food, clothing and services by the consumer. Here again there are enormous possibilities for the elimination of waste, not by any destruction of human initiative or by the regimentation of the individual's life, but by a wider understanding and application of the knowledge already available. The study of dietetics suggests the possibility of more varied,

cheaper and more wholesome food than tradition and custom have hitherto established. The domestic work of the home may be carried out more systematically, more economically, and with a greater use of mechanical appliances Houses can be enormously improved in convenience and in beauty.

Rationalisation is not only applicable to every variety of activity involved in the total economic cycle, from the work on the soil which yields our basic raw materials to the final consumption of manufactured goods it is equally applicable to every stage of organisation involved, and thus to the work of every individual in the economic hierarchy

The individual housewife in her cottage, or the single small-holder labouring on his plot, may apply scientific methods to the physical operations involved in their daily tasks, to the selection of their equipment, and to the personal measurement of the results which they obtain They will find large wastes which can be eliminated and greater satisfaction in the more efficient performance of their tasks The psychological and physiological conditions of such workers offer large opportunities for the elimination of waste and discomfort

In the small business enterprise employing two to a dozen persons there are similar openings for a more intensive study of the operations involved and of the equipment provided No single small employer can be at the same time psychologist, statistician, engineer, marketing expert, salesman, and economist But he can be alert and ready to make the best possible use of the material provided by institutions concerned with these sciences. He

can be prepared to foster and further methods of co-operation between individual businesses, whether in competition or no, which will place at his disposal wider knowledge in these fields, and particularly methods of its practical application. That is to say, he can at least do his utmost to overcome the limitations imposed by size through a frank recognition of the possibilities open to businesses of larger scale, coupled also with a similar objective examination of the special advantages which will enable him to survive. Even in the smallest business, where the proprietor supervises personally every process, there are often large wastes. He lacks the mental discipline of a constant exchange of views with colleagues and superiors. What is nearest the eye is frequently hardest to see.

In a productive or distributive business of medium size, the employer is forced to delegate some proportion of his authority and responsibility. Here problems of organisation arise which are as open to objective and scientific study as a problem in engineering or chemistry. The whole question of the proper distribution of duties between individuals in an enterprise is still little appreciated by business men. More than any other single issue it contributes to the accumulation of unnecessary waste, and its faulty adjustment is largely responsible for much of the misunderstanding and bitterness which impair relations between employers and employed. In such cases also there will be wide opportunities for the application of psychology and physiology to the movements of the individual worker, for more scientific methods of marketing, and for the introduction of statistical controls.

The same considerations which are applicable to the medium-sized business are of still greater importance in proportion as the size of the undertaking increases In the modern large-scale business we find a progressive series of ranks and responsibilities running from the individual worker through the foremen and various groups of managers and officials up to the Managing Director. The work of all these individuals may be scientifically studied and systematically co-ordinated With each addition to the size of the undertaking, the question of motivation becomes of greater importance. (How to obtain and maintain the concentrated, freely-willed effort of each individual in the organisation becomes *the* problem of the leader.)

Here again scientific method is the only way. Traditionally we have been accustomed to make certain assumptions as to how men and women ought to act and feel, and to base our industrial practice upon them But under modern conditions it is being recognised more and more that the only secure basis of decision is the dispassionate study of how actually they do act and feel. Only when the work of each individual is so adjusted as to bring into play the whole complex of motives within the range of his personality can waste be avoided. Every flicker of discontent, every failure to use available initiative, sets up friction in an organisation composed of human beings. Understanding and the acceptance of a common purpose by all concerned, a comprehensive and adequate scheme for the partition of responsibilities and functions, freedom from distraction by social or family troubles, proper equipment and physical environment, moti-

vation adapted to the full spiritual content of each individual . . . it is only when you have all these things that any group can work together with the minimum of waste. And such conditions can only be achieved by the continuous use of all the knowledge which science has already given us, and the progressive application of scientific methods of thought to those questions in which we at present lack any such definite basis of action.

Further, it is only in the largest individual undertakings that resources are available for the employment of the highest quality of specialised personnel in all the different branches of knowledge of which modern business must make use. And moreover such personnel will inevitably lose their zest and their originality unless they are afforded frequent opportunities of comparing their methods and their results with other workers in the same field. For both these reasons—the necessity for a rounding out of knowledge not available within the structure of the business and the maintenance of the professional enthusiasm of technicians—even large sized undertakings must lend themselves freely to the exchange of experience and results. New forms of collaboration between otherwise independent enterprises, having this specific end in view, are rapidly developing all over the business world. They take the form of conferences, conventions, professional associations and institutions, grouping of businesses for the study of management, and so on. But they one and all emphasise both the growth of a more rational approach to business problems and the necessity of this continuous education by contact with other minds for all those

who seek to fill positions of responsibility in our economic order

If any evidence is required as to the possibilities of economy presented by the application of scientific methods in every branch of the individual undertaking, whatever its size, it is to be found in the experience of those factories which have already made substantial progress in this direction They are one and all unanimous that the striking results already obtained are merely an indication of the possibilities still before them (The effect of progressive doses of rationalisation is not to convince them that they are highly efficient, but merely to reveal unsuspected opportunities for further economy and programmes for improvement which will occupy the attention of their managements for an indefinite period in the future)

While, however, on the scale of the single undertaking the application of Rationalisation can reduce wastes over large areas, there is, of course, a limit to this process fixed by the competitive conditions of our existing economic system Probably the greatest hope of all implicit in the new conception is the prospect of an attack from a similar angle on the wastes which are outside the individual control of the single enterprise The objective consideration of these wastes, which does not regard them as inherent and inevitable, has already yielded very valuable results It has issued in new forms of collaboration between different businesses other than those already mentioned For instance, difficulties created by the excessive multiplication of products cannot be eliminated beyond a certain point by the individual action of any

one producer. What is required is a conjoint examination of the facts by all the parties to that particular economic process, producers, distributors at various stages, and consumers.

In this matter the Department of Commerce of the United States, under the secretaryship of Mr. Hoover, has laid the foundations of what is virtually a new technique in the relations between the central Government and business. It has sought no powers of compulsion: it has not needed them. But it has used two special advantages only enjoyed by the State. In the first place the State has an immense command of information, the necessary pre-requisite to the scientific consideration of any subject. In this respect it has an incomparable advantage as contrasted with any individual producer. Secondly, its position is clearly disinterested. It can take the initiative in bringing interests together for the discussion of a common problem without arousing that suspicion which is inevitably associated with any similar action by one or other of the parties.

For these reasons the Department has succeeded in trade after trade in uniting all concerned for an examination of the losses and inconvenience caused to all by the multiplication of patterns and sizes of similar articles, which result from competitive pressure and a short-sighted view of market requirements, uncorrected by any common policy for the trade as a whole. While the State has supplied the initiative and the necessary information, business men themselves, through their various trade organisations, have done the actual work required to arrive at agree-

ments for the reduction of these complexities Such agreements, once thoroughly considered, need no legislation for their enforcement The advantages to the traders concerned are sufficiently obvious to secure a sufficient measure of adherence to the common programme In a very large number of industries the number of lines and sizes have been reduced by proportions varying from 40% to 90%

This process of simplification paves the way to the adoption of standards, both of measurement and of quality Standardisation, pushed to its logical extreme, would of course result in a limitation of the consumer's choice and a rigidity in methods of production which would be both uneconomical and undesirable On the other hand, provided reasonable attention is paid to the requirements of the market, a larger degree of standardisation on a national and international scale must increase the security of the consumer and lower the price of products and services, both directly and by ensuring greater economic stability Here again the scientific approach is necessary both for the purpose of determining suitable standards and in perfecting the procedures for their application The methods of collaboration designed for this purpose are again bringing individual businesses into contact, and securing approximation to a common policy

New forms of collaboration for special purposes of this type are found in many other connections Trade Associations, for instance, have been instrumental in introducing standard costing and accountancy systems which, again without compulsion, have commanded the adherence of the

majority of the employers in certain given trades. Such systems have undoubtedly resulted in forcing manufacturers who were producing at an uneconomic level to examine the facts of their situation. This has proved a corrective to the tendency to price-cutting which, however much it may benefit the consumer at the moment, produces a state of economic insecurity which is bound to be to his disadvantage in the long run. In other trades we find schemes of combined or institutional advertising which have proved profitable to all concerned.

But on the whole the largest wastes to be found in the present economic system are those which occur at the points of junction of undertakings and industries. The technical conditions of modern manufacturing and the economies possible with mass production provide a constant impetus towards the specialisation of manufacture, not only of single articles, but of single parts of the same article. These economies, however, are apt to be lost where the control of such specialised units is not sufficiently concentrated to secure the closest possible planning of the total production and its relation to the potential market. There is thus a continuous drive towards the amalgamation of business enterprises and the creation of larger units of control.

Finally, these larger units again tend to become associated both nationally and internationally in the search for greater price stability and security against the erosion of the producer working at an uneconomic level. Two main problems are presented by these developments. In the first place, the administration of these large associations becomes progressively more difficult and complex.

The problems involved in managing 25,000 people are qualitatively different from the problems involved in managing 1,000 people Business has yet to work out the proper methods of training and education which it must apply if it is to find the leaders it will require in the immediate future It is clear that the process of haphazard and ruthless personal competition which has hitherto been considered the normal and sufficient provision to this end will not suffice It is unlikely to produce a type of man intellectually equipped for such tasks and, still more, of the necessary width of social outlook and moral calibre

The greater stability of prices secured by the greater concentration of productive power and the elimination of competitive variations may also degenerate into fixity of prices at a higher level than is necessary adequately to reward the capital and management skill involved in production While it cannot be too strongly urged that whoever bears the immediate loss due to large fluctuations of prices, the ultimate cost has to be paid by the consumer, it may still be necessary to protect him against temporary exploitation of this character But here again the best hope of collective action lies in the extended application of the scientific method, and particularly of that publicity which is one of the hall marks of genuine scientific work In so far as analysis and comparative research evolve principles of administration and standards of accomplishment, the community will find itself in possession of a measure by which to gauge the quality of the service rendered by those to whom it entrusts the direction of its economic life

CHAPTER IV

IMPORTANCE FOR THE BUSINESS MAN

THE change of attitude towards economic problems included in the term Rationalisation, and the various movements to which it has given rise, are of immense importance to the individual engaged in business, whatever his rank and purpose. If he be employer or manager, they are literally vital to him. He must understand their significance or perish. It is no longer possible to conduct business successfully on the narrow basis of individual experience or by "rule-of-thumb" methods. Even in those cases where ownership of patented processes or a tactical advantage in market position results in a satisfactory level of profits for the time being, the apparent security is illusory. It can only be rendered permanent as the result of a balanced efficiency in every department of operation, an efficiency which takes active advantage of the most recent thought and of the latest discoveries which bear on any aspect of the activities of the concern.

Throughout the nineteenth century, Great Britain enjoyed a supremacy in the arts of machine production which opened to her the markets of the world. The sale of the commodities which she manufactured was a phase of business which she could, to some degree, afford to neglect or to leave to others. In the early years of the twentieth

century that position had already altered, a change which was greatly hastened by the economic upheaval of the war and post-war period Other nations, and more particularly the United States of America and Germany, developed their industrial activity and productive capacity at an accelerating speed.

Unhampered by the traditions and habitual attitudes which had grown up around the earlier British establishments, they were in a better position to take advantage of new scientific discoveries, and to make experiments in the art of industrial control. In recent years, this process has been greatly accelerated Sweden, France, Czecho Slovakia, and Italy, among many other European peoples, have done much to consolidate their position and equipment as modern industrial nations

More particularly, the advance of scientific discovery has enormously increased the variety of possible methods of solving any particular technical problem The developing industrial communities were thus enabled to discount to a great extent the advantages of position, climate, and proximity to natural resources, such as coal and iron, which had largely determined the predominant position originally enjoyed by Great Britain. A striking example of this tendency is the success of Italy in expanding the hydro-electric resources of her Alpine frontiers It is calculated that a unit of electric power at Milan cost in 1926 only 51 7 per cent. of its cost in 1913 For a ton of Cardiff coal, on the other hand, the consumer had to pay 116 7 per cent of its 1913 cost

The effect of these changes may be traced to some degree in the difficulties experienced through-

out the last decade in the coal, iron and steel, and textile industries. No doubt these difficulties have been in part attributable to War disturbance, fluctuations in the financial field, uncertainty as to exchange values, and the complex problem of re-adjusting production to the requirements of peace. But neither the difficulties of the basic industries, nor the exceptional circumstances of the time, constitute the whole story. They but serve to emphasise a tendency which was already well established before 1914, and to exaggerate the symptoms of a complaint which would have become increasingly apparent even if the war had not taken place.

Great Britain no longer enjoys, nor can ever again enjoy, her traditional ascendancy as "the workshop of the world." Increasingly she must be prepared to face a wide variety of competitors in every department of production, and an intensity of distributive effort quite new to her experience. Her degree of success in maintaining the comparatively high standard of life enjoyed by all classes of workers, and in absorbing her large surplus of unemployed, will depend more and more with each succeeding year, not on any natural advantages, but on the flexibility and sheer efficiency as organisers of production which her employers and managers can develop.

It is abundantly clear that, whatever may be necessary in the way of temporary adjustments, any permanent depreciation in the standards of life and the amount of real wages enjoyed by the great mass of the population presents no solution of the problem. Such a change could not in fact be brought about without grave social disturbance. Moreover,

any appreciable decrease in the earnings of the individual worker would re-act immediately on the power of absorption of the home market American experience is emphasising the fact that, under modern conditions of manufacture, standardisation is of the essence of the matter But standard methods of production can only be established on the basis of a secured and established market Here again there is a definite change taking place in economic thinking

More and more those immediately engaged in the control of production are realising that there is no direct connection between the level of earnings of the individual worker and low unit cost of manufacture On every side are object lessons to the contrary Not only in the works of Mr Henry Ford, but in countless other factories, the cost curve and the curve of average individual earnings move not parallel, but in opposite directions Given good organisation and sound management, it is almost always possible to combine these apparently opposed tendencies—an increasing wage and a lower unit labour cost

From all these angles Rationalisation is of supreme importance to the individual business man Whatever the difficulties of Great Britain's present economic position, there is little doubt that she possesses the resources to deal with them She has the most highly skilled body of labour in the world She has a unique geographical position She still enjoys exceptional natural advantages Her reputation in the trading world for integrity and high quality of product is unrivalled She inherits a magnificent commercial and industrial tradition If any evidence of these facts is called

for, it is open for all to read in her success in exploiting the new industries such as artificial silk, electrical supplies, and chemicals, where her leaders were less hampered by established methods and the deadweight of obsolete investment. There has been no lack of initiative and flexibility in these new fields.

But these resources must be mobilised and adequately directed over the whole area of her industrial life if she is to maintain her position. Every single individual engaged in her industry must be determined to make the fullest possible use of every variety of knowledge with which science can equip him in facing his daily task. He must be prepared for the personal and co-operative effort which is needed to investigate many sources of specialised information, and to adapt methods and discoveries, actually developed under dissimilar conditions or clothed in the intricacies of technical language, to his own practical requirements. Above all, he must secure that the operations of his concern are *balanced* as efficient as possible in every direction, not merely highly developed in the sphere which happens to interest him particularly.

Only so can he hope to maintain his own competitive position, to play his part towards his fellow traders by maintaining the level of consumption in the home market, and fulfil his double obligation to consumers and to his workers by combining low-unit cost of production with high individual earnings. The business man who will not adopt modern methods is not only risking bankruptcy for himself and unemployment for those dependent on him—he is a menace to other businesses, and a constant brake on the wheel of national prosperity.

CHAPTER V

SCIENTIFIC MANAGEMENT

THE aspect of Rationalisation which is of the most direct interest to the individual employer in dealing with the problems of the single business concern is that movement towards a new approach to the general task of direction and control which is described as Scientific Management This movement first took shape under the inspiration of an American engineer named F W Taylor, who died in 1915 An educated man, he started his industrial career as a machine hand He was quickly promoted foreman Attempts to overcome the systematic "ca' canny ' which was endemic in his shop led to a direct struggle with the workers The conflict sickened him He set to work to discover some new basis for the wage contract which would be definite and assured

From the beginning he appreciated that the trouble underlying all forms of payment was the fact that the management did not know what constituted a fair day's work on the part of the men He set to work to study the whole problem afresh from the beginning From these studies developed directly the modern methods of job analysis, time study and motion study. He obtained greatly increased outputs His men gained earnings 30% to 60% in excess of the normal rates

Taylor, however, did not stop at this point. He appreciated that if he set his men standard times, he must provide them with the standard conditions which would make it possible for them to achieve standard times. He proceeded to study the whole of the environment connected with their work with the same meticulous and scientific precision which he had applied to their operating methods. Many of his most important discoveries arose directly from these inquiries. Thus, examination of the material, angle of cut, method of grinding, and other factors bearing on the efficiency of cutting tools, led to the evolution of high speed steel. Difficulties with the speed of machines started a whole series of experiments into the care and maintenance of belting.

As Taylor's work expanded in a larger plant, he discovered that his chief difficulty was to find men fitted to teach and supervise the principles of management which he had evolved. From this flowed the most important of all his developments. He abandoned entirely the ordinary form of organisation under which each foreman is responsible for everything that happens in a particular area. Instead he substituted what he called "functional foremanship." Under this arrangement each foreman was responsible for one activity, discipline, planning, routing of work, and so on, wherever it was carried out in the shop. This idea, with its flat contradiction of the older conception of organisation, that "no man can serve two masters," is still imperfectly understood. But it is the logical consequence in the field of organisation of the scientific method of approach which Taylor

had originally applied to materials, machines, and processes It outlines new possibilities for effective co-operation which are only now dimly discernible on the industrial horizon

In the later years of his life Taylor retired from direct participation in business, and devoted the whole of his time and a large proportion of the considerable fortune he had made to spreading the knowledge of his methods of management As early as 1890 he had first made some of his experiments public at a meeting of the American Society of Mechanical Engineers But it was not til 1912 at the hearing of the Eastern Rates case that they achieved a wide publicity In this case certain shippers on the Eastern seaboard appealed before the Inter State Commerce Commission against an application by the Railway Companies to raise rates Counsel for the shippers brought evidence to prove that by applying the Taylor methods of management, the railways could save $1,000,000 a day

Up to the time of his retirement, Taylor had had little opportunity to reduce the experience which he had been accumulating through practice to any coherent scheme, any statement of fundamental principles But as he applied himself more and more to the teaching and exposition of his ideas, he saw, with ever increasing emphasis, that what was peculiar to his system was not any particular device or method, but a new attitude towards the whole question of industrial management That attitude was distinguished by its uncompromising refusal to accept traditional ways of doing things He never accepted any solution to an industrial difficulty which was based on

established usage, personal experience, or rule of thumb. He viewed each problem as it arose from a new angle, and applied to it the scientific technique which he had acquired during his training as an engineer. That is to say, he regarded it as a result dependent on a series of causes subject to definite and ascertainable laws. He envisaged his task as a manager primarily as a piece of scientific investigation devoted in each successive instance to analysing the situation, measuring the facts, experimenting with the basis thus obtained, and finally discovering, proving, and applying the laws.

It was this new attitude, this fresh angle of approach to the problems of industrial control, which constituted Taylor's great contribution to the art and science of management. While his achievements in material and methods were so considerable that men still speak of "the Taylor system," he would have been the first to object to the term. It was not high speed steel, the care of belting, planning, mnemonic classification, or functional foremanship which were his great gifts to the world, but the suggestion of that "mental revolution" which he so often emphasised as necessary to the application of his methods.

Taylor was a pioneer. As is usual with pioneers, his work suffered considerably both from the jealousy of smaller rivals and the too great orthodoxy of his disciples. For a time Scientific Management was understood to mean a rigid application of the particular methods Taylor had adopted, rather than a new way of thinking about industrial questions. This tendency re-acted particularly unfavourably on its reception in Great Britain. The oldest and the

most traditional of the industrial countries, manufacturing largely for world-wide export markets, it was clear that the whole conditions of this country made any slavish imitation of methods developed under other circumstances out of the question Particularly the position as between employers and workers—the established strength of British Trade Union organisation—was markedly different from the American situation

Prior to 1914, a few employers here and there had given serious attention to Taylor's work, and had studied it from the practical standpoint to discover how far it could be adapted to their own circumstances In such cases there was a natural tendency towards a close copy of the Taylor systems and devices In the majority of instances they were never heard of, or, if attention was called to them, dismissed as a temporary enthusiasm, another "fashion" from the land of "efficiency and hustle" But in Great Britain, as in other European countries, the war led to a demand for enormously increased production from a depleted personnel, particularly in the engineering industries There was a general loosening of traditions and established practices both by employers and the organisations of the employed The tremendous development of new forms of armaments and of aviation combined with the constant drive of urgent necessity to liquefy the solid conservatism of certain sections of British industry Devices which would increase production were eagerly canvassed and rapidly applied The war spirit of national solidarity broke down the barriers between class and class, trade and trade Necessary consultation with allies

provided an impromptu and unsuspected education in comparative methods.

Much of the work done was undoubtedly superficial. There was little or no attempt to organise factories scientifically throughout. But while a full appreciation of its philosophy was lacking, many of the features of Scientific Management were established once and for all as common practice in British industry. More particularly cost accounting, planning, and certain aspects of personnel management became recognised features of all well-managed concerns. Great advances were registered in the industrial use of the material sciences, chemistry, physics, mineralogy, and the like.

In the period immediately following the Armistice, this spirit of general inquiry, of readiness for change, persisted. The Ministry of Reconstruction was charged officially with the duty of reviewing the lessons of the war period and making recommendations for the transition to peace conditions. Several of its publications dealt with various aspects of Scientific Management. But, as was perhaps inevitable, there was no co-ordinated and dispassionate attempt to view Taylor's work as a whole and to study its relations to British conditions. The whole temper of the times was against such an approach to the question. On the whole, the official recommendations were limited to calling attention to the value of specific management devices or to a general exordium on the importance of scientific method. They did not envisage or make explicit the far-reaching change of mental attitude necessary for the successful application of the philosophy of Scientific Management.

At the same time the period witnessed the establishment of much useful machinery, both of an official and voluntary character—machinery which was essentially in line with Taylor's cast of mind Thus the Department of Scientific and Industrial Research, with its correlated Trade Research Associations and national research laboratories, the Industrial Fatigue Research Board, the National Institute of Industrial Psychology, the Industrial Welfare Society, the Institute of Cost and Works Accountants, and many similar bodies came into being

One or two attempts were made to establish a national Scientific Management organisation. In one case a body of people interested in management questions set up an Institute of Industrial Administration For a time plans were on foot to start an English branch of the Taylor Society, an American organisation founded in memory of F. W. Taylor But these attempts had no substantial backing from English industrialists, and faded into the background for lack of support The country was suffering too acutely from the re-actions of the war, individuals were too deeply concerned in adjusting themselves to the changed economic environment, for large-scale effort in a new order of thought.

The severe industrial depression of 1922–26, and the drastic economies in national expenditure which it enforced, damped down many of the high hopes of the war period and the years which immediately followed it There was a general tendency, particularly marked among business men, to look back to the years before 1914 as a kind of standard to which they should direct their efforts. Many of the experiments which had been undertaken were

abandoned under pressure of losses. The majority of the younger men who had survived were disillusioned and cynical. The older leaders in industry and politics were worn out with the war effort. They were in no mood for new undertakings. "Normalcy" was in the air.

Despite these conditions, much of the changed mental attitude, which had resulted from the upheaval, survived. Here and there in every industry employers of special vision or courage re-organised their concerns to meet the changed conditions. The new industries already mentioned expanded and developed. Though the depression involved many drastic financial reconstructions, there were some equally dramatic recoveries—notably in the case of undertakings which took the opportunity to overhaul their management on scientific lines. Of the various organisations and institutions which had been established, those which were well-founded, with adequate scientific personnel and a policy of service to industry, expanded and did valuable work. Broadly speaking, there was a steady growth in the number of businesses which, some consciously, some unwittingly, made an increasing use of the principles and methods of science in the control of their affairs. But, almost without exception, they either ignored or expressly disavowed any connection between what they were doing and the Scientific Management movement founded by F. W. Taylor.

For this attitude there were special reasons, based on the acute opposition to the whole movement developed by organised labour. As is now increasingly recognised, this opposition was in part based on misunderstanding of what had actually occurred in

the United States, and was in part an expression of the general unrest inseparable from the readjustment of values and the return to peace conditions

Taylor, through his life, was actuated by feelings of the deepest sympathy and fellowship for the workers The principal factor in his earliest experiments was an acute disgust with the dragooning methods of management which were common in the American machine shop of the 'eighties He felt that the conditions of fear and hostility which these methods had produced were fatal to any effective co operation, and that they destroyed all mutual confidence at the same time as they eliminated every motive for productive effort His one desire was to find some method by which the vicious circle of speeding, rate cutting, suspicion, and more speeding, could be broken He believed that it was possible so to organise almost any manufacturing concern that it would be vastly more productive, and that each party to the arrangement would benefit, the consumer in lower prices, the employer in greater profits and increased security, and the workers in substantially higher earnings

These motives directly inspired his earliest experiments in time study, motion study, and the differential rate Moreover, he stuck closely to these ideas in his practice In every case he insisted that the greater productivity achieved by the worker under his methods should be met with a proportionately greater reward. In one instance where he suspected that an employer was not standing fully by this undertaking, he described him succinctly as a "hog" He insisted again and again both in his speeches and writings, that the real

difficulty in installing his system did not lie with the men, but with the managers. It was the management which would not change its attitude and face up to the new responsibilities which Scientific Management laid upon it. He believed that his method of fixing rates by time study, of determining accurately the exact dimensions and conditions of each worker's task, of securing that those conditions were fulfilled, of arranging the flow of work and the methods of control, so that each worker was carefully instructed how to obtain the greater output required and helped to achieve it, had indeed removed the whole of this troublesome question of wage rates from the area of conflict into the field of law. As far as he himself was concerned his contention was realised in practice. With one minor exception, there was never a strike in any works which was re-organised under his personal direction. For the extravagant opposition to "Taylorism" which developed in the American labour world, we must look elsewhere than to the man himself or to his personal work.

More immediately that opposition started as the result of work undertaken by some of Taylor's associates in the Navy yards of the United States. Taylor was asked if he would advise in the re-organisation of some of the Government arsenals at a period after he had given up active participation in business and was settled near Philadelphia, engaged in making known his ideas on management. He felt that as a patriotic citizen he was not in a position to refuse. But the situation which he discovered was such that he had little opportunity to apply Scientific Management or to develop his methods

to a stage at which they had any prospect of success

The management of the Navy yards was at that time entrusted to sea-going officers of the fleet, who were merely seconded for short periods of shore duty in these establishments They had little or no knowledge of the duties required of the manager of what was essentially an engineering factory Nor had they any incentive to acquire such knowledge, since they regarded their period ashore as a temporary rest from the real responsibilities of their profession as executive officers of a ship The small corps of naval constructors had no direct responsibility for the naval establishments they were advisory only

As a consequence, the actual management of the Navy yards had fallen almost entirely into the hands of the civilian foremen and craftsmen As might be expected, under such conditions, applied to a Government undertaking subject to political influences in a country where the spoils system was a recognised political weapon, the condition of affairs was extraordinary In one yard there were five complete over-lapping staffs, corresponding to five sections in the department of the Secretary for the Navy Taylor's representative, who was sent to deal with the problem on the spot, found himself faced with an array of sinecures, vested interests, and other forms of corruption He started in on the work of clearing up the management situation Taylor's inevitable rule before touching any question connected with the workers It was enough to bring a storm about his ears

In the meanwhile Taylor himself had put forward a proposal that the management of the Navy Yards

should be taken out of the hands of the active officers of the fleet and entrusted to members of the Corps of Naval Constructors. Here again, an industrialist, innocent of experience in this particular field, roused a hornets' nest of Service politics. Within a short period a change in the personnel of the Secretary for the Navy robbed him of his support in high quarters. He persisted for some time and even had an interview with the President. But in the end he abandoned the attempt, which he had undertaken somewhat unwillingly as a public duty. The Navy Yards have since been drastically re-organised largely on the lines he suggested. His brief excursion into the unaccustomed sphere of non-competitive State enterprise had, however, focussed the attention of the craft unions concerned on the danger to their members who held redundant jobs, if this special stronghold was re-organised on Taylor's lines.

Their fears were reinforced by the immediate consequences of the popular interest in Taylor's work aroused by the Eastern Rates case. All over the United States, men with the barest nodding acquaintance with Taylor's methods, sometimes with no knowledge of them at all, offered themselves to employers as "experts" qualified to instal Scientific Management. Now there is no question that certain of Taylor's devices—time study and the differential rate for instance—if applied unskilfully can be made the instruments of terrible oppression. They do add to the power of management by adding to its knowledge: and power can always be abused.

This is particularly the case where they are unrestrained by that general respect for truth, or by that insistence that standard conditions established by the management must precede standard performance demanded from the men, which were the corner-stones of Taylor's philosophy. He himself, and his immediate assistants, had come to recognise that far the most difficult and exacting portion of their task in re-organising a works, consisted in changing the attitude of the management Indeed it was so exacting and made such great demands on moral courage, that they spoke about it with each other as "the hell period." It was hardly to be expected that the casual self seekers who were trying to exploit Taylor's goodwill, would either appreciate the necessity for this part of the process, or possess the weight to face it if they did. In the majority of cases they lacked Taylor's scientific spirit, his patience, his thoroughness, and his sympathy for the workers Under their auspices, many crimes were committed in the name of Scientific Management

A further factor which contributed to Taylor's *unpopularity with organised labour was undoubtedly* the exploitation of the opposition roused among the craft unions by professional rivals and fellow business men of the type who are always interested in depreciating the work of their more far-seeing contemporaries In the latter part of his life he had to bear more than the usual share of the mud which is commonly slung at eminent personalities In more than one instance there was definite treachery by men he had trained and helped. The process of depreciation was helped by his own

sensitiveness in the matter of scientific integrity. The more he came to realise the possibilities inherent in his methods and the intricate difficulties of installing them successfully, the less was he willing to entrust their installation to any but skilled hands. His circle of assistants towards the end was reduced in practice to four men, all of them tried engineers with a complete understanding of his fundamental philosophy. This narrowing of the circle of recognised initiates was in itself something of a challenge to jealousy. Whatever the causes, it is certain that in his last years, Taylorism and Taylor's methods became a storm-centre of controversy. As is usual in such circumstances, antagonisms were sharpened, and things were said on both sides which would not stand the test of dispassionate consideration.

More particularly, Taylor himself was driven into an attitude of open criticism towards Trade Union organisation. The opposition of the Craft Unions was expressed with a violence of phraseology that no word or action of Taylor's could possibly justify. These discussions had their reverberations in the English labour world. Moreover, their effect was reinforced by a study of his writings in the light of special national conditions and prejudices with which he was unacquainted, uncorrected by any understanding of the circumstances in which he wrote.

All Taylor's earlier public descriptions of his work were addressed to the American Society of Mechanical Engineers. Throughout he was a practical man, concerned with doing rather than with the art of descriptive writing. His main preoccupation was to convince that particular audience

that they ought to pay more attention to management. And he knew that that audience was mainly composed of hard headed business men. Secure in the knowledge of his own ideals as to the treatment of labour, he did not say a great deal about that aspect of the matter, though what he said was very much to the point. He did say a great deal about the added responsibilities which management must assume and about the increased output obtainable by his methods.

His books, where they were read by English Trade Unionists, were read by men biassed already by the attitude taken up by the American Federation of Labor. They were studied for debating points not for understanding. Great play was made with his study of handling pig iron, and his description of the man suitable for this class of work as an "ox like" man. No attention was paid to the fact that these very experiments were an early example of scientific fatigue study and the use of organised rest pauses. Moreover, English organised labour, even had it read Taylor impartially, was in no mood in the years just after the Armistice, for any ideas involving radical changes in industrial organisation. Its immediate and most pressing pre occupation was with the restoration of the Trade Union conditions which had been abandoned to meet the war pressure. It was anxious to retain and consolidate the large gains in national prestige and public recognition which it had registered.

The special developments of the study of psycho technology, which started with the report of the Health of Munition Workers Committee, resulted about this time in the establishment of the Indus-

trial Fatigue Research Board and the National Institute of Industrial Psychology. These bodies, while doing work precisely along the lines which Taylor would have welcomed and appreciated, were naturally anxious to avoid identification with the object of so much unpopularity. Undoubtedly Taylor had, in his anxiety to make his case clear, unduly emphasised the importance of "the one best way" of doing a given piece of work. He was unacquainted with the science of experimental psychology, a science which had developed with remarkable rapidity between 1910 and 1920. The psychologists rightly insisted that more attention must be paid to individual differences, that the unmodified conception of "the one best way" might prove definitely harmful to the worker in a number of cases. But the importance of this correction was undoubtedly over-emphasised in their anxiety to disavow any connection with Taylor's methods. Unconsciously it did injustice to the scientific integrity of his general outlook.

Employers, faced on the one hand by extreme sensitiveness on the part of organised labour in respect to any suggestion of introducing scientific management, and on the other by the disclaimers of experts, were not likely, even where they perceived value in Taylor's methods, to encourage a wide publicity as to their origin. Moreover, there was a great hopefulness that the effort towards closer co-operation which found expression in the Whitley Scheme would issue in a permanent improvement in industrial relations. No one was in the mood to challenge industrial conflict if it could

in any way be avoided Thus it came about that, throughout a period in which increasing use was made of Taylor's methods and ideas, his name was seldom used in connection with this work except to explain that it had nothing to do with Scientific Management

This was unfortunate—not from the standpoint of Taylor's reputation that is already secure among far-seeing executives, above any turmoils of temporary controversy—but because it led to an ill-balanced and disjointed development of the science of Management in Great Britian Employers tended to over-emphasise some particular activity which happened to interest them personally They "took up" Welfare or Psychology or Costing or Technical Research as the case might be Their businesses suffered the usual penalties of lack of balance Then they reviled scientific methods, when what they needed was more science Through apprehension of Taylor's unpopularity with Labour, the broad lesson of his philosophy, of his fundamental attitude towards Management, was disregarded

It is, however, being recognised more clearly year by year, not only in the United States but in almost every industrial country, that whatever the value attaching to Taylor's particular systems and devices, permanent advance in the technique of busi ness administration can only be achieved by using the scientific approach, the method of thinking, which he was the first to apply in this particular field Thus, in hundreds of factories where his name has never been heard of, and in relation to business problems which he never attempted, the effect of his work is felt It has issued in a less personal and more detached approach to matters

which present difficulty, an attempt to marshal, analyse, and measure the facts, to base conclusions and action on controlled experiment rather than on tradition or guesswork. It has given to business men an altogether new conception of efficiency, of what is possible with modern methods of machine production.

In the second place, there has been a profound, though recent, change in the attitude of organised labour towards work. This change of attitude has been taking place among the leaders of labour with accelerating speed during the last three or four years. The unprecedented prosperity which has been enjoyed by the United States has been explained in terms of a doctrine of high wages. It is improbable that this principle was applied as deliberately as some subsequent observations suggest. But it has engendered a very definite assumption of wider responsibilities by certain employers. Over increasing areas of industry it is recognised that, whatever the immediate economic argument for wage reductions from the standpoint of a particular factory, such a policy has a wider re-action in reducing the total purchasing power of the market as a whole—a re-action which in the long run is bound to affect adversely the individual employer who has benefited by the immediate reduction. Closer attention to the organisation of production has emphasised the fact that decreasing unit costs are not irreconcilable with increasing individual earnings. There is a growing recognition that the stimulus of high piece rates is entirely neutralised unless there is a conviction among the workers that such rates will be immune from arbitrary

cutting These considerations have all led to the more general conception that in times of adversity the earnings of labour are the last, and not the first, direction in which the employer should look for economies

At the same time the general scientific approach, which Taylor had applied more particularly to the immediate problems of production, was carried over into the wider issue of improved relations between employers and employed It was recognised that this question is not merely a matter of charity or goodwill on the part of the management, but a serious business issue on which the competitive efficiency of any undertaking ultimately depends Rapid advances in the study of factory hygiene, fatigue, and experimental psychology indicated directions in which science could assist the manufacturer American employers, viewing the organised hostilities of European industry, and faced with a growing, though less consolidated, Trade Union movement, have devoted an ever-closer attention to the roots of discontent. The detailed study of industrial relations in the individual factory has given rise to a wealth of experiment in many directions

The leaders of American labour did not fail to note that in the enterprises which had most thoroughly absorbed the outlook of Scientific Management both these conceptions, so vital to the future welfare of the worker, were most readily accepted, and led to the most successful developments Time was given for experience to demonstrate that the ruthless or ignorant application of Taylor's devices was a policy doomed to failure

by its own inherent weakness. Employers became more cautious and eclectic in the employment of consultants. The bogus efficiency engineer proved a temporary scourge. The widespread national movement for the elimination of waste, which owed its inspiration to Mr. Herbert Hoover's Secretaryship of the Department of Commerce, had its effect. In recent years the President of the American Federation of Labor has frequently spoken boldly in favour of measures for the more scientific organisation of production. At a recent conference a representative of the printers described how his union had established their own consulting engineers. These were prepared to assist the employers of the industry to increase the efficiency of their establishments on scientific lines.

A similar change is noticeable in Great Britain. Particularly in their attitude towards piece-rate and bonus methods of payment, a number of Unions have considerably modified their policy. Notably, the Amalgamated Engineering Union have declared in favour of such methods subject to suitable safeguards. Recently a section of workers in the dyeing trade struck against the failure of a certain number of the employers to adopt payment by results. The Report of the Committee on the Health of Munition Workers first called public attention to the fact that excessive hours and adverse working conditions are not only undesirable from the human standpoint, but involve definite economic loss. The Industrial Fatigue Research Board and the Institute of Industrial Psychology, established as the result of this inquiry, have worked quietly but with increasing success throughout a

decade While they have acknowledged no direct allegiance to Taylor, and have in certain cases demonstrated fallacies in some of his detailed methods their approach to industrial problems is fundamentally in line with his basic philosophy It has demonstrated to the workers that the scientific spirit, properly understood, recognises no parties and no interests It is concerned solely with establishing the facts The conclusions which follow may, and frequently do, point to just such developments as are the avowed objects of Trade Union policy

At a recent public conference the Secretary of the Iron and Steel Trades Confederation said 'Rationalisation involves Scientific Management, a much misunderstood term This does not mean the regimentation of labour, a sort of goose step to the time of the machine, (it means the science of good management, good government in industry, applied to the workshop, winning the co operation of labour for the elimination of waste in human effort material and organisation, and in getting the best results in productive enterprises and services) Combined with this is the acceptance of the principle that, in the science of good management, cutting down wages and extending hours of labour is the last and not the first resource' [1]

Similarly the resolutions of the World Economic Conference on Rationalisation were endorsed by all the leaders of organised labour who were present Great care was taken in drafting the resolutions to secure that due safeguards for the interests of

[1] Arthur Pugh, Secretary Iron and Steel Trades Confederat on, speak ing at League of Nat ons Union Conference The Guildhall, December 15th 19 7 Reprinted in *World Prosperity and Peace*

the workers were emphasised as a necessary part of any scheme for introducing Scientific Management. The supposedly ruthless atmosphere which surrounded Taylor's work in its early years has almost completely disappeared. The employer in Great Britain who wishes genuinely to improve the organisation and efficiency of his plant by the study and application of scientific methods has nothing to fear to-day from prejudiced labour opposition—always provided that he is prepared to meet the legitimate interests of his workers to the utmost degree which the circumstances permit, and to take them into his confidence as to his purposes and intentions.

A further aspect of the development of Scientific Management which is of interest to employers, is the rapid spread of an international movement for the exchange of ideas and experience bearing on industrial management. The Government of Czecho-Slovakia, very ably led in the difficult reconstruction period following the Armistice, saw the value of the idea, and the contribution it could make towards the reconstitution of European industry. The first International Congress was held at Prague in 1924. It was attended by delegates from six different nations in Europe and representatives from the United States. In 1925 a further congress was held at Brussels. On this occasion ten nations were represented. The third congress took place in Rome in 1927. Here the attendance exceeded all expectations. Over 170 papers describing developments and applications of Scientific Management were contributed to the proceedings. The congress was attended by over 1,400 delegates,

representing forty-five nations In 1924 the International Committee for Scientific Management had been established to organise and carry forward the work of these Congresses.

In 1927 the International Labour Office, in conjunction with the Twentieth Century Fund in the United States, and the International Committee, established at Geneva the International Management Institute The Institute was equipped with premises and staff The movement was thus provided with a central clearing house where information as to applications of Scientific Management from all over the world could be collated and classified The Institute also acts as a means of bringing into contact the industrialists of all countries who are interested in management questions.

In several European countries, notably Czecho-Slovakia, Germany, Italy, and Russia, national institutions have been established with Government support for the purpose of research and propaganda along Scientific Management lines In other countries national committees of a voluntary character are doing interesting and valuable work All over the world inquiries and experiments are proceeding which are inspired with the idea of eliminating waste and perfecting administrative methods by the application and extension of the scientific technique first employed in this field by F. W. Taylor. As methods for the exchange of experience and mutual co-operation along international lines are developed, it is probable that the advance in the technique of management will be even more rapid than that which has occurred in the last quarter of a century.

Already Taylor's general approach to management questions has been used in many fields, far outside the immediate problems of works organisation with which he was primarily concerned. That he himself appreciated this possibility is illustrated by his study of golf-greens. Investigators are engaged in research in the applications of scientific method to agricultural work of various kinds, to domestic problems, to banks, and to Government departments.

Within the limits of the business world, mention has already been made of the important developments in the study of industrial relations. Scientific Management has been carried over into the field of distribution. Experiments have been made in the more effective planning and control of the work of salesmen. Large areas of waste, with resulting possibilities of economy, have been revealed. Similarly the organisation and operations of retail establishments have been subjected to analysis and measurement on Taylor lines. Instances can be cited from all branches of retail activity, large department stores, single shops, and chains of multiple shops.

In short, the conceptions underlying Scientific Management can be usefully employed in every direction where organised human effort calls for direction and control. That they should spread into every corner of business activity is in direct accord with the general intellectual tendencies of the time, and inherently in line with the march of events.

CHAPTER VI

RESEARCH

CLOSELY allied to the application of scientific method to the problems of management, and equally covered in the resolutions of the World Economic Conference, is the movement towards the intensive application of research to the material and technical questions which arise in business life The accelerating tendency to apply the results of physics, chemistry, mineralogy, botany, biology, and countless other sciences to industrial processes is essentially a part of the rational organisation of production and distribution The last quarter of a century has witnessed a tremendous growth not only of laboratories and other institutions devoted to scientific study for its own sake, but of establishments of the largest size maintained by individual businesses, by associations of employers and by municipal and national governments for investigations into the application of new scientific knowledge to industrial problems

In this direction the opportunities for profitable action are more immediately obvious In the earlier stages of machine production, the employer was typically a man who understood the technique of making something English business was largely built on such practical skill, combined with a keen appreciation of the importance of quality and the

risk of sacrificing it to considerations of quantity production. There was, therefore, a definite emphasis of interest in the direction of the problems of manufacture.

As advances in knowledge of the physical sciences have opened the way to fresh sources of material of all kinds and to the possibility of new and cheaper manufacturing processes, the employer who wished to maintain a flourishing business has been compelled to keep abreast of such movements. If he would not, his competitors emphatically would. Apart from this the achievements of the physical sciences, new products, machines, and processes were more dramatic, easier to appreciate in financial terms, than the advantages to be gained by an improvement in management methods. Incidentally they were less personal, less inclined to encounter the habits and traditions of the individual.

Despite these considerations, however, Great Britain was somewhat slower than certain of her competitors in making full use of the enlarged resources which the scientists placed at her disposal. At the conclusion of the war, the Government was anxious to correct this situation. The Department of Scientific and Industrial Research was established. In addition to maintaining a number of laboratories for special purposes—notably the National Physical Laboratory—it has established twenty-six Research Associations in various trades.

These Associations are co-operative: part of the funds are provided by the Government, and part are subscribed by the various firms who are members of the Association. They undertake fundamental

researches into scientific questions bearing upon the industry concerned, particularly where such inquiries appear too costly or likely to occupy too long a period, to be readily undertaken by the individual concern. In addition they provide laboratory facilities and scientific service for firms which are not in a big enough way to employ special staffs Many of the larger factories in the country maintain their own chemists and research engineers. Important Research Institutes have been established by certain industries apart from the work of the Department

But, while great strides have been made in the application of the physical sciences through pure and applied research, the situation is still far from satisfactory It is clear, in the first place, that Great Britain is spending far less on constructive industrial research than the United States, and probably rather less than Germany Moreover, far less than the full possible use is being made of the results which have been achieved in many directions For this there are various reasons

There are still a large number of businesses in the country where those responsible have not yet appreciated the full significance of modern scientific development, even on the technical side They prefer to trust to traditional craft skill and the methods which have proved profitable in the past Or they lack the moral courage to face the alterations in organisation and the writing down of machinery which are constantly necessary if they are to keep abreast with scientific discovery

Apart from these, many who appreciate dimly the force of the tendencies to which they are subject, who are even ready in a general way to subscribe

to research undertakings, are unable to apply the findings of the investigators in their own factories. Lacking the scientific knowledge themselves to comprehend what is implied in the various developments which are taking place, they seem unable to organise their businesses so as to obtain the necessary assistance. Or, where they possess the skilled assistance, they seem unable to integrate it with the craft methods and the normal system of control within the works. In an old industrial country such as Great Britain, there is necessarily a big weight of tradition. The introduction of new technical methods undoubtedly encounters greater resistance, and requires a more sustained effort on the part of those in control, than is the case with some of her competitors. But cases are not lacking of manufacturers blandly inquiring from their Research Associations as to problems on which they had received full information a couple of years before, or devoting considerable time, effort, and money in conducting experiments on questions which had already been exhaustively worked, and concerning which ample knowledge was readily available.

It is in this direction that Rationalisation has the most direct bearing on Research in the narrower sense as limited to the technical side of production. Large expenditures on staff and equipment, the most perfect laboratories, and the most highly-skilled investigators, must fail of adequate results in industry, unless businesses are so organised as to apply their findings promptly and effectively. This is largely a question of correct management structure, which makes due provision for the delegation of responsibility so that those in control are

not over burdened with detail, and which at the same time secures that all necessary types of skill are provided and co ordinated Modern science is at present developing, specialising, and expanding its fields of inquiry, at a speed greater than that shown by the majority of businesses in adjusting themselves to the new conditions (Practically speaking, it is only the scientifically managed factory which is in a position to take full advantage of the progress of invention and discovery)

The term Research has so far been used in the somewhat narrow sense of laboratory work in the physical sciences For reasons already given, this aspect of the question has received the most attention in Great Britain But the idea of research methods and their application to industry covers a far wider field Broadly speaking, wherever a manufacturer diverts any portion of his resources from the normal routine conduct of his business, either to inquire into the facts on which his future decisions should be based, or to examine the possibilities of improving his methods in any direction, he is engaging in research Viewed in this light, research appears as one of the first essential steps in the general process of developing a more scientific form of industrial control

In the individual business several difficulties are normally encountered in developing research work The day-by day conduct of the concern usually calls for close attention and unremitting effort If the staff is economically balanced, the whole time and energy of the principal managers are occupied by their existing duties Improvements, where they are introduced, are conceived hurriedly, and are

frequently carried out as the result of a special drive after the normal day's work is accomplished. Where the expenses of the undertaking are closely controlled, as they should be, the engagement of extra employees seems difficult to justify. The results of researches which have yet to be undertaken appear speculative and vague.

As the knowledge bearing on various forms of business activity becomes more detailed and more refined, the standard of education necessary to absorb it, and to apply it to concrete problems, rises. To see quickly how a new development in any particular science can be integrated with the daily practice of a large organisation calls for constructive imagination. This quality is not readily developed by a close attention to routine duties. It calls for a manager with unusual powers, and a high degree of training both theoretical and practical. Such men are rare, and, when available, are the first to appreciate and to be absorbed by the numerous duties and responsibilities which exist in every vital industrial enterprise.

At the same time, the evidence of every successful business which has undertaken serious research work is conclusive. It pays, not only in the material sciences, but in many other directions. For instance, the organisation and systems of every business, however well-managed, require constant amendment if they are to keep pace with changing conditions of trade. It is almost impossible for the man engaged in routine administration to do this work. Other reasons apart, mere force of daily habit blinds him to wastes and unnecessary complexities, which are quickly visible to an outside investigator.

In general, experience suggests that in most instances research should be entrusted to members of the staff specially allocated for that purpose and freed from any routine duties Such investigators need not themselves, however, be highly-trained in all instances Where the duties of management are suitably divided between the principal officers of a business, so that each specialises in one or a few functions, such officers can provide the stimulus and specialised knowledge necessary to guide subordinates specially allocated for research in those functions Careful organisation will secure that the routine duties allotted to them allow them time and opportunity for this work

The main essential is an appreciation that work definitely directed towards the improvement of methods and processes in every branch of the business is necessary and profitable It cannot be carried out by tired men deeply immersed in daily administration Nor is it safely entrusted to those immediately concerned with the routine management of departments and sections Save in the case of the very smallest enterprises, the employment of at least one member of the staff definitely entrusted with this duty will always be found to be a wise investment In larger concerns the numbers which can be employed economically in specialising in various types of research have always exceeded the expectations of those who have attempted the method

Other directions in which research methods have been applied successfully to business are numerous

The older conception of Accountancy as a means of preventing speculation and of showing the general cash results of business transactions at infrequent

intervals, has been greatly modified, partly as the result of the application of statistical methods to business control. Statistical science is, of course, in itself a method of research. It has been applied in many directions to throw more light on the actual facts of business. The comparatively new profession of Costing goes behind the general profit and loss in any period, to the detailed expense of various items in the total and to the contribution of the different articles and sections to the profit figure.

Following on the more exact view of the facts of expenditure thus rendered possible, business men evolved better methods of maintaining constant control of the elements of waste. Modern management demands that expenditure in excess of what is anticipated or of what the business will bear should be examined and checked immediately. It is of little use to hold a "post mortem" examination after such expenditures have accumulated and have resulted in a loss on the trading period. This has led to the evolution of a technique of Budgeting. All expenditures and receipts are estimated in advance, and a definite margin of profit is planned for the accounting period. Figures of actual results are presented at frequent intervals. Those responsible for the business are thus enabled to make the necessary adjustments to meet changing conditions of trade promptly and to secure a closer control over the actions of their subordinates.

Statistical research has also developed the use of Graphic methods for analysing and presenting facts. Many tendencies and causes which cannot be discovered when presented in long columns of detailed figures, are readily observable if expressed

physically in lines or other geometrical patterns The limits of human attention and concentration can be much enlarged by charts, correctly designed to emphasise any deviation from the normal More over, figures expressed in this form are subject to the mathematical laws governing the behaviour of curves and correlations An additional check is thus provided for testing the validity of conclusions

In a wider field statistical research is leading to the development of Business Forecasting One of the greatest difficulties from which business men have suffered in the past has been the recurrent rise and fall of general trading prosperity This periodic and apparently inexplicable alteration of boom and slump has been accompanied by disturbances of price levels and security values It has resulted in severe losses on stocks, great uncertainty in planning business developments, and acute unem ployment It has tended to produce among business men a fatalistic attitude towards their responsibilities They feel that they are in the grip of external forces which they can neither understand nor control "Bad business condi tions" become the excuse for bad judgment and the absence of vigilant administration

Economic science, using the method of statistics, is in process of analysing these movements and providing methods of measuring business tendencies No complete explanation of the whole process is yet available and it cannot therefore be brought entirely under the control of the community But there are already indicators which can be of great assistance to the individual trader in forecasting movements of purchasing power, money values,

and similar factors affecting general business conditions. He is thus enabled to lay his own plans on a secure basis of fact and with less reference to the emotional atmosphere about him. The general feeling of optimism and pessimism which accompanies these business movements is itself pregnant with mass suggestion. Men's feelings re-act to the crowd and cloud their judgment. They thus exaggerate the current tendency. The mere fact that an increasing number of individuals in responsible positions are enabled to consider the situation in a detached way in the light of cold figures, will itself do much to reduce the rapidity and extent of these changes and to stabilise business conditions.

Research methods are also being applied with increasing results to the material and moral factors which bear on the efficiency of those employed in industry. The work of the Industrial Fatigue Research Board and of the National Institute of Industrial Psychology has already been noticed. In both these cases we find a combination of the latest discoveries in Psychology and Physiology, based on laboratory experiments, with field research into results when they are applied to the practical problems of the works. Such field research again makes full use of modern developments of statistical method both to measure its material and as a secondary check on the accuracy of its conclusions.

Apart, however, from the application of specific sciences, business men themselves are approaching questions connected with the employment of labour from the research standpoint. In many factories figures are compiled indicating the incidence and chief causes of absence, whether due to sickness or

to other reasons Problems of labour turnover—overtime and its relation to output, earnings and efficiency, the selection of recruits, the effect of rest pauses and refreshments, and so on—are being studied from this angle A manufacturer wishing to test a new ventilation system, for instance, chose two rooms with similar atmospheric conditions and occupied by workers of the same sex, age, and general physical condition engaged on similar processes, he installed the new system in one of the rooms, and then made careful comparisons of the incidence of sickness in the two rooms before and after the new apparatus was installed Controlled experiments of this description are essentially research and lead to practical conclusions of great value in increasing the efficiency of any working force

Lastly, research methods are invading the Distribution field 'Market Research," as it is called, involves two rather separate lines of inquiry

In the first place there is the intensive statistical study of particular areas from the standpoint of the article in which it is proposed to trade Much of this work can be carried through by the analysis and re arrangement of existing published material Census figures, directories, and similar sources are employed to dissect the population into various appropriate groups according to purchasing power, special interest, family responsibilities, and so on Unemployment figures and other economic indices are used to correct the actual results of distributive undertakings and to separate the fluctuations which are due to external circumstances from those which are attributable to causes lying within the control of the organisation

Secondly, markets are examined by direct field research. This work is carried out by trained investigators who actually visit a large number of consumers. They ask a few simple questions about the product they are investigating and the buying habits of the individual. Their reports are collated and treated statistically. Provided a reasonably large number of people are included in the inquiry and the areas chosen are properly selected, valuable evidence is obtained by this method of "sampling" as to the possibilities of selling this or that article, and the methods of distribution likely to yield the most satisfactory results.

Generally speaking, the technique of applying these research methods to distribution questions is as yet in an experimental stage. But they are already widely used, notably by some of the leading Advertising Agents, to test the available market for new products which are offered to them and to measure the effect of alternative channels of publicity. There are also a number of enterprises which specialise in providing research services of this type to the individual manufacturer. An approach along these lines to the very difficult problem of maintaining sales offers to the business man a far better prospect of definite and controlled results than the older "hit or miss" methods.

As a result of these various tendencies, there are already a very large number of agencies in Great Britian which may help the individual employer to make a wider use of research methods. Some of them are definitely engaged in pure or applied research bearing on the broader problems common to whole industries. Others are concerned with

the provision of the statistical or other material which is necessary for the successful application of research methods to the problems of the individual business Others offer skilled assistance in the difficult task of applying the results of more general researches to the situation of a particular concern Others again engage in research activities bearing upon industry as a result of professional association, and with a view to enlarging the scope and usefulness of the members of a particular craft Yet others are primarily educational in purpose, but necessarily undertake much valuable research work in the course of preparing their pupils for the various scientific and technical occupations

By far the largest proportion of such agencies are at present concerned with the physical sciences The work of the Department of Scientific and Industrial Research has already been described The Trade Associations which it has established vary very greatly in importance and value In almost every instance they are used to the full only by a circle of the more progressive employers In every industry there appears to be a proportion of undertakings, more or less considerable, whose management is lacking either in the scientific knowledge necessary to apply the simplest findings of the association's investigators or in the enterprise to appreciate their significance in terms of profit

In addition to these Associations, the Department either maintains itself, or co operates with other Government departments in maintaining, laboratories or research stations for special purposes or applicable to special industries Several of these are prepared to undertake specific inquiries into

problems presented by individual firms or associations of employers. The actual cost of the necessary work only is charged. Services of this description are of special value to the small undertaking which cannot maintain the skilled staff to deal with all the technical problems with which it may be confronted. They are also of value to the larger concern in clearing the ground when new developments are under consideration which are outside its normal experience. Such institutions also can sometimes afford large-scale experimental equipment which would prove an unprofitable investment if set up by the individual concern. The tank for testing wave effects maintained by the National Physical Laboratory is a case in point.

In certain instances Trade Associations have, of their own initiative, established important research institutions for dealing with the technological problems of a particular industry. Examples are the Shirley Institute for the Textile Trade and the Institute of Glass Technology.

The majority of the Universities have faculties of engineering and chemistry. Some of the newer foundations, particularly in the industrial areas, are equipped with schools of technology in a large variety of trades. These are frequently established and conducted with special reference to the industrial requirements of the particular area and with the advice of Committees of employers. They are anxious to co-operate with the business world both to secure that their teaching is on lines which will assure their graduates a technological equipment of practical value and to maintain touch with the latest industrial developments. Research and

experimental methods are an essential part of their curriculum They will frequently undertake investigations for the individual business, provided that the problem is within the compass of their resources

Certain research of a technological character is also undertaken by the various Institutes of Engineers, Chemists, Mineralogists, and so on But their main function from the standpoint of the employer is to provide a clearing house for new ideas and developments in the particular professions with which they are concerned Their libraries in certain instances constitute the best available collection of specialised literature from all over the world bearing on the particular science and its industrial applications All published material is thus brought together, and the immense task of keeping pace with developments is facilitated Important work on fuel economy has been initiated by the Federation of British Industries

On the statistical side, a certain amount of research is carried out through the agency of various Government departments and special inquiries The Board of Trade supplies figures bearing on our imports and exports, and similar commercial questions The Ministry of Labour collates a large amount of information relating to Wage Rates in various trades, unemployment, and other industrial questions falling within its purview The Home Office, through its Factory Inspectors' reports, and the Ministry of Health in dealing with occupational disease approach the collection of data bearing on industrial life from yet other angles The Board of Trade Journal, the Ministry of Labour Gazette, and its annual

Abstract of Labour Statistics, all contain matter of direct practical moment to the employer. The decennial census of Production gives a synoptic view of the growth of British Industry; it is to be regretted that the work of collating and tabulating the figures frequently delays publication till two or three years after the events recorded.

On the whole, however, this vast accumulation of information is not presented or integrated in the forms most directly calculated to be of practical service in the solution of business problems. It is historical and statistical rather than a working tool, applied to immediate questions. It is in the course of special inquiries that the State's resources of statistical material are most frequently focussed to a point, and made the basis of recommendations and decisions as to working policy. The Samuel Commission on the Coal Industry, and the Balfour Committee on Industry and Trade, are examples of such inquiries.

Apart from Government activity, there are few agencies for statistical research. Here and there the Universities sponsor undertakings in this direction, and certain important papers are presented to the Royal Statistical Society. In this connection the work of Sir Josiah Stamp and Professor Bowley, and some recent inquiries by Professor R. M. Carr-Saunders at Liverpool, are of interest to industrialists. In addition, the question of business forecasting is dealt with by the London and Cambridge Economic Service—a joint undertaking by two Universities, intended to provide employers with a reasoned digest of all the statistical information bearing on the future course of trade. The Federa-

tion of British Industries also provides its members with a statistical review of business conditions

Research into accountancy methods and comparative costs has not yet been undertaken on any general scale The resources of the Institute of Costs and Works Accountants are hardly as yet equal to work of this description A certain amount of investigation in this direction has been done in connection with the special Government inquiries already dealt with In addition, an important and extended inquiry resulted in the setting up of a standard costing system for the printing industry This has proved an immense boon to employers engaged in the trade

A number of important inquiries into various forms of occupational disability, the employment of the defective, and similar matters, have been undertaken by the Medical Research Council.

Physiology and Psychology are a field in which this country has tended to take a leading place Since its foundation the Industrial Fatigue Research Board has published over fifty reports dealing with the mental and physical conditions making for effective production These investigations are concerned with questions which are common either to industry as a whole or to all engaged in certain important trades The National Institute of Industrial Psychology and Physiology, on the other hand, serves the individual employer Its staff of trained investigators may be engaged at a fee to examine the situation in any individual concern, and to recommend measures for the application of the latest scientific developments to the problems presented Its increasing fund of experiment and

experience in dealing with the difficulties of a large variety of establishments is an important national asset. Far-sighted employers are making an increasing use of its services. In addition, it is carrying through an important piece of research work on the subject of vocational selection.

On the problems comprised under the general heading of Welfare or Industrial Relations a number of investigations have been carried out. The Ministry of Labour has issued reports on Industrial Councils and Works Committees. The Home Office publishes two valuable series of pamphlets dealing with questions of industrial welfare and safety. Among voluntary agencies whose work includes inquiry into questions of this character are the Industrial Welfare Society, the Institute of Industrial Welfare Workers, the National Industrial Alliance, and the Labour Co-partnership Association.

Market Research is as yet inadequately organised. The Department of Overseas Trade publishes an annual report on the economic conditions of most of the more important countries to which we export. The Empire Marketing Board has been conducting more detailed inquiries into suitable products, methods of packing and presentation, and other factors bearing on the volume of inter-imperial trade. The Federation of British Industries, by means of its representatives in various markets overseas, keeps its members in touch with requirements and conditions. The Balfour Committee has issued an important volume dealing with export markets in relation to certain basic industries. But in general, the conduct of detailed statistical researches into the requirements of

certain specific markets, and the means by which manufacturers may adapt their methods of production to meet the openings so revealed, has been left to private hands It is doubtful if, in view of the enormous field to be covered and the possibilities inherent in an enlarged knowledge of the facts, any individual concern working for profit will be able to do full justice to the opportunities for research in this field Some form of co operative and co ordinated national action appears to be essential There is in existence a Market and Management Research Association of Great Britain But while it has done useful propaganda work, its resources are small

On the executive side of Distribution, the methods of giving practical effect to the policies determined upon as the result of inquiry into markets, little has been accomplished The Incorporated Sales Managers' Association of the United Kingdom provides a nucleus for possible organisation It has already undertaken several valuable inquiries into selling methods But here again resources are inadequate, and the professional solidarity and interest of this technical calling have yet to be developed

Finally, the whole of the more general field which is included under the term "Administration" is woefully lacking in agencies for Research The bulk of F W Taylor's work was carried out in the individual machine shop It was primarily concerned with the worker and his relations to his immediate supervisors He had little opportunity of extending his studies into the more general issues of business administration Thus even those in Great Britain who have most keenly appreciated the value of

Taylor's philosophy, and of the technique which he developed in investigating business problems, have only slowly arrived at an appreciation of the full scope of the term "Scientific Management."

A leading French mining engineer and industrial leader, Henri Fayol, defined administration as including planning, organisation, direction, co-ordination, and control. All of the industrial activities comprised under these headings still await systematic investigation as far as Great Britain is concerned. A number of employers who are interested in the question have organised themselves into Management Research Groups for mutual exchange of information and the development of inquiries. But the importance of work of this character and its ultimate financial value still await recognition. Personnel trained for research work in this field and adequate resources are alike lacking.

In connection with the public and municipal services the situation is somewhat easier. The importance of administration is more readily recognised in an environment where the requirements of a consistent policy are less readily subordinated to the immediate exigencies of competitive trading. The publicity which is an essential condition of service under democratic forms of Government itself secures a closer attention to the principles on which action is based. The Institute of Public Administration is doing important work in organising the study and comparison of Governmental methods both central and local. Employers who are brought into contact with this Institute are struck by the close correspondence between the problems examined and those which face industrial managers.

CHAPTER VII

THE FIELD OF MANAGEMENT

IT is clear that the field to be covered by the individual who aspires to manage a business scientifically is both wide and complex This is true whether the enterprise be large or small It is sometimes suggested that the refinements of modern knowledge and modern methods, whether in technique or administration, are the prerogatives of the large-scale concern It is imagined that they are only applicable and useful where mass production and standardisation can be fully developed

This is not so Theoretically the proprietor of the one man business unites in his own person all the functions and the activities which are characteristic of the mammoth concern with a quarter of a million employees He should plan, organise, coordinate, and control his own work He should buy and test his purchases He should manufacture and store He must sell He should keep records He should research into new methods and opportunities for improvement He should conduct correspondence and transport goods and material In short, he should be a microcosm of all the Managing Directors, Production and Sales Managers, Buyers, Chemists, Engineers, Psychologists, Advertising Managers, clerks, foremen and operatives who staff a large modern works As surely as his work in any

one of these manifold capacities is less informed and less efficient than that of one of his many competitors, to that degree will he fail to conduct his business to the best advantage.

It is, of course, impossible in practice to find the one-man business which is equally developed in all these various aspects of its activity. What usually happens is that such businesses prosper because the individual concerned has some particular capacity which enables him to render a special service to his customers which is personal to himself, and with which the concern with large resources cannot compete. Yet even in such cases, disaster frequently supervenes because in some one or more of the many necessary aspects of his work the individual is lacking in the essential minimum of knowledge or experience.

The same is true *mutatis mutandis* of the small-scale unit whether in production or distribution, employing from five to two hundred persons. Only in exceptional instances can a business of this size afford to employ really high-grade specialists in more than two or three of the main functions which make up the total of its activities. In so far as it cannot do so, it is at a disadvantage compared with its larger competitors. This difficulty may be met by the employment of outside experts in a consultative capacity or by specialising members of the existing staff, who, while lacking the educational background and the advanced scientific training to develop the particular field in which they work to its highest potential, are enabled by their concentration on a particular branch of management to achieve a useful standard of special knowledge and skill.

It frequently happens, however, as with the one-man business, that the special interests of the individual in control tend to concentrate his attention on one or two of the main aspects of his business Moreover, unwillingness to delegate authority or perhaps to recognise to the full the possibilities inherent in specialisation, even with a comparatively uneducated personnel, lead to the neglect of certain functions One experienced business leader said recently that "it is more important to have all the functions of a business developed as to 10% of their possible efficiency rather than one function developed to 100% efficiency at the expense of some of the others "[1]

This principle of "balance" in the conduct of an enterprise is of the greatest importance It imposes upon those responsible the obligation of taking measures to secure that each and every function is conducted with the maximum of detailed knowledge and specialised experience which their resources permit them to command

In the case of the large business unit with many thousands of employees and an ample turnover, the problem of providing for the necessary specialised knowledge is less pressing In many such concerns in Great Britain research libraries have been estab lished which call the attention of the various specialist officers of the undertaking to everything new which is published in their particular field The advantages of such an arrangement where it is properly organised can be very great In such cases, however, a new difficulty is encountered in securing that their

[1] Henry S Dennison speaking to the Market and Management Research Assoc at on of Great Britain

various forms of knowledge may each contribute the maximum of advantage to the common purpose. That is to say, the question of organisation calls itself for special research and study. The possibilities inherent in this subject have, as yet, been imperfectly realised by business men.

Many businesses work successfully with an organisation which has grown up loosely over a period of years. But such undertakings are always at the mercy of sudden changes either in trading conditions or in their personnel. Moreover, as with smaller units, there is always the risk of special emphasis on certain functions, due to the exercise of those functions by individuals with particularly strong personalities, or the failure of other individuals in the functions which they are presumed to represent. A whole new series of problems in dividing up duties and activities, allocating individuals to the jobs so created, and co-ordinating their efforts, are brought into being immediately a business grows beyond the size which is susceptible to the direct executive control of a single personality. When a body of highly-skilled specialists is correctly organised so that each one of them puts forward persistent and co-operative effort towards the execution of a common policy, the results in output and profit far exceed those secured by a concern employing an equally competent personnel who are, however, less carefully co-ordinated.

In Great Britain, however, as among the remainder of the industrialised nations, the typical forms of economic enterprise are in a stage of extremely rapid transition. Up to the end of last century, the unit business, whether large or small, with the single

factory and a single organisation, was the normal expression of industrial activity To day the combination of businesses under a single control plays an increasingly important part in the economic life of the nation Such combinations appear in a very wide variety of forms, and are achieved as the consequence of many different motives and by multifarious methods No satisfactory classification or descriptive terminology has yet been established Words such as Merger, Fusion, Consolidation, Trust, Pool, Cartel, and the like are used in different senses by writers on economic subjects In practice all such arrangements imply to a greater or less degree a concentration of the higher control of a number of undertakings which are also, to a greater or less degree, independent units In some of the larger combinations in Great Britain, over a hundred legally autonomous companies are brought under a single control

While the actual number of single business units is, of course, vastly in excess of the number of combinations, the proportion of the working population employed by such large multiple undertakings is constantly increasing They present a form of complex organisation, as opposed to the single organisation of the unit enterprise, which raises its own series of problems for the management It is clear that their command of highly specialised technical skill of all kinds is greater than that of even the largest single concern On the other hand, the difficulties of co ordination, of securing that the fullest use is made of the available knowledge, are proportionately greater Especially where the various units in a combination are widely separated

geographically, it is essential to secure some degree of local autonomy and authority in order to enforce responsibility. At the same time the views of those holding such locally responsible positions are sometimes an obstacle to the full utilisation of all the specialised capacities at the command of the combination.

The practice of different combinations as to the degree of centralisation or delegation of authority and initiative with regard to the various functions of industry varies very widely. Broadly speaking, no common practice or defined principles have as yet been established in this matter, comparable to the generally accepted standards applicable to the organisation of the single unit enterprise. On the other hand, the potential economies inherent in large combinations, which usually constitute the underlying motive for their formation, must fail of realisation unless this broad administrative problem is satisfactorily solved. Only when the relations between the various units and the central controlling body are so adjusted as to secure that the whole of the specialised ability available is fully applied in every branch of the combination's activities, can such ability be obtained and used on the most economical terms.

At every level of business activity, from the one-man concern to the vast combination operating in a dozen countries, the responsible administrator or manager is faced with the same common problem. He has to secure that in every field of activity he brings to bear the fullest measure of scientific knowledge which his resources can command. Only so can he secure that his effort is both well balanced

and flexible Lack of balance will result in in efficiency in certain important functions Lack of flexibility will lead to ignorance of, or failure of adjustment to meet, changing economic conditions which are outside his personal control In either case he must face inevitable waste and loss

If he is to guard himself against these possibilities he must keep continuously before his mind a picture of the *whole* of the activities necessary for the successful conduct of the enterprise, and of the provision which he is making to secure that they are adequately performed That is to say, he must in the first place analyse the total effort involved in the efficient management of the concern into its constituent activities or functions

The actual arrangement of such an analysis, the way in which the different activities should be grouped, particularly for practical purposes in dividing responsibility, is still to some degree an open question But the points leading to difference of opinion are, comparatively speaking, unimportant Broadly, a standard list of the main functions involved in the management of any undertaking is now generally accepted by all students of business organisation This list will of course vary as between producing and distributing businesses, in that the latter will not include the function of production or manufacture

Every business concern involves in the first place four main groups of activities These are concerned with

(*a*) General Management, that is the maintenance of the organisation of the enterprise, the co-ordination of effort, and the

exercise of a general executive control over all activities.

(*b*) Finance, that is the provision of capital for equipment and working expenses, records to indicate progress from the cash standpoint, and other figures of a statistical character used as a guide in the control of activities.

(*c*) Production, that is the actual extraction or processing of raw materials, or the provision of a service.

(*d*) Distribution, the disposal of the goods or services provided by the business to those who require them.

But underlying these main groups, and to some extent cutting across them, there are a number of functions which can be clearly distinguished and which, under modern conditions, call for specialised knowledge if they are to be handled effectively. These are:

(*e*) Personnel, that is all the tasks directly involved in handling the employees of the concern of every grade, in engaging them, in dismissing them, and in caring for their welfare in the broadest sense.

(*f*) Technical Research, that is the maintenance of the processes and equipment of the concern at the highest level of efficiency possible in the light of the scientific knowledge available.

(*g*) Purchasing, that is the maintenance of all supplies of any kind required by the enterprise

(*h*) Transport, that is all the tasks involved in the moving of materials or goods, whether within or without the factory

Moreover, falling within the main groups, though sometimes as a matter of convenience allocated to one of them and sometimes to another, are other special activities Thus the maintenance of the organisation requires initially that it shall be built up in accordance with the law of the land governing that particular form of enterprise, and there are a number of other causes which may force a business to undertake activities of a legal character Business organisation itself is a special study requiring much research and unremitting attention to developments in this field in all parts of the world In all large concerns the office methods employed call for the concentrated attention of one or more specialists It is not possible for the manager with other more important duties to keep in touch with the very rapid growth of new forms of office machinery and equipment, or to devote the necessary time and attention to working out and applying new systems

Under the financial group there is a tendency to distinguish between the work of the Accountant proper and that of the Cost Accountant or Statistician The latter is primarily concerned with statistical records rather than with the double entry system of the business which leads up to its Trading Accounts In addition, in the sections of this group there must also be included the new

science of Business Forecasting which is directly concerned with the financial control of an enterprise. This has necessarily to be handled by a trained economist if the best results are to be obtained.

The Production group gives rise to special technique both in the direction of Planning and of Design. While there is at present no recognised profession of Planning, and insufficient definition of the functions and position of those occupied with Design, the distinction between those activities and the day-by-day conduct of producing departments is now fairly clearly recognised. The separation of Planning from performance was one of the principles most strongly emphasised by the earlier students of Scientific Management.

Technical Research, in the sense given to it here, covers, of course, a very large number of different specialists. The maintenance of processes and equipment may involve the knowledge of architects, chemists, and a large number of engineers in special trades. In addition it may call for workers in a variety of other sciences. How far each of these fields of special knowledge should be exploited separately is a matter for the individual concern. But undoubtedly one of the main difficulties of administrating modern technical processes is to obtain sufficient initiative for an increasing number of specialist occupations without losing the necessary co-ordination of those activities. The sub-division of the profession of engineering into a large number of highly specialised techniques is an example of a process which is steadily spreading throughout the skilled professions.

The Distribution group has usually hitherto been regarded as including the functions of Selling and Advertising But it is becoming recognised with increasing emphasis that the actual task of selling goods or of controlling those who sell them, differs, in the personal qualities and the knowledge it demands, from the task of examining the potentialities of new or existing markets In certain very highly organised modern businesses the subject of marketing or merchandising is treated separately from the administration of the actual selling or advertising

It seems probable that the next big step in the evolution of business organisation will be the general recognition of a group of problems, which may be included under this head of marketing or "Merchandising," as a quite distinct function, calling for the attention of a separate division or department equal in importance to the departments of Production, Distribution and Finance Such problems include

(*a*) The question of what goods the business is to sell, how is its price list to be constituted? Is it to contain one line or five lines, or five hundred? When are lines to be added, and in accordance with what principles? When are lines to be withdrawn from sale?

(*b*) The question, closely related to the last, of examining new uses for the goods which the business is in a position to make, or even of inventing new wants which it will be in a good position to supply An example of the first process was the discovery that the disinfectant "Milton" could also be used for cleaning dentures An example of the second is the

work done by a manufacturer of sealing wax to popularise the making of artificial jewellery and other decorative craft work in this medium. In the past such issues have frequently been left to chance. But the modern business manager who wishes to make a positive and constructive effort to enlarge his market must organise the search for opportunity deliberately.

(*c*) The question, when new lines are to be launched, of their exact design and presentation, the methods of packing and labelling, the markets to which they are first to be introduced, the publicity to be arranged, and above all the co-ordination of the various specialised activities in a definite programme so that the issue may take place with every detail ready.

(*d*) The question of the price policy to be pursued by the business. Is it going to attempt to sell X units at A shillings each yielding £Y of profit, or will it attempt to sell X units at A–1 shillings each yielding £Y–1 of profit, but a larger profit in total owing to the economies possible with a larger output?

(*e*) The question of how much the business is going to attempt to sell in each succeeding period. What is the task it will set before its salesmen? On what figures is it going to base its plans for production? Without such planning in advance, ordered management is impossible. Even where this decision as

to future sales is not arrived at consciously and deliberately, it is nevertheless taken in fact, if not in word

(*f*) What arrangements are to be made to keep the business informed of the activities of competitors and the relative position on the market which it occupies?

(*g*) What is the policy of the business with regard to quality? What standard is to be set and how is it to be maintained?

(*h*) Is the business to seek to expand its sales by its existing methods of distribution or by new methods, by more intensive effort in its existing markets or by seeking new markets? If decision on these questions is to be based on investigation and research, what form is such research to take and how is it to be organised?

It will be noted that the great majority of these problems are on the border line between the more obvious administrative duties usually assigned to Production and Distribution Moreover, to some degree, they involve an inevitable conflict of immediate interest For instance a simplified price list is a necessity for economical mass production on the other hand, too narrow a limitation of the range offered may make it impossible for the sales force to achieve the required turnover Rapid adjustments to meet fluctuations in fashion and consequent demand will raise production costs failure to adjust quickly enough will result in surplus stocks and consequent loss Someone has to decide

at what moment a market tendency may be regarded as established and plans must therefore be changed. A new line presented by production may be technically adequate, but unsuited to the requirements of the market at that particular moment.

Decisions on all these issues go to the heart of the commercial policy of the business. In any small undertaking they will probably be dealt with by the Managing Director himself in consultation with his Production and Distribution Managers. But they necessarily involve a considerable amount of detailed co-ordination. And as the undertaking grows in scope the Managing Director must necessarily free his hands of all routine or recurrent activities of this description. On the other hand the conflict of immediate interests to which we have referred involves an unnecessary strain on the goodwill of the Production and Distribution Managers if they are merely left to adjust these matters between them.

For all these reasons certain progressive businesses have already tried the policy of introducing a special Marketing Manager—a third party not involved in the immediate administrative preoccupations of either making or selling—to whom these special duties are entrusted. Obviously he will not need a large staff, his work being rather investigational and deliberative than administrative. But personally he must be at least equal in authority and experience to the managers of the other main divisions of the business.

It is too early as yet to say whether this actual form of organisation structure will prove permanent in business life. It has undoubtedly served a very

useful purpose in calling attention to the separate character of these marketing problems and their integration with both production and distribution. It thus emphasises the fact that they cannot be settled separately by either party if a balanced judgment is to be obtained In any business which aspires to a scientific form of management, machinery must be established by which they can be isolated, investigated, and made the subject of definite decisions Their very importance from the standpoint of the profit and loss account has sometimes in the past led to a certain slurring of the issues, no individual wishing to take the responsibility of making definite estimates in an uncertain field where mistakes and their consequences are so obvious and so serious Whatever the actual form of such machinery, the point of major importance is that the Managing Director or other chief executive should himself appreciate clearly the existence of this group of questions and their special characteristics The signs that this is increasingly recognised are probably the most important single development in the field of management at the present time.

CHAPTER VIII

THE FIELD OF ADMINISTRATION

THE previous chapter was concerned with the internal "management" of a single enterprise and the duties and activities involved. The term "management" is often used as synonymous with "administration." One of the first of the consequences which follow from a more scientific approach to business problems, is an attempt to define more accurately the terms employed in talking and writing about industry. This can only be done in the light of a detailed analysis of the actual activities and duties which are covered by such terms and their relation to existing business practice. Confusion, often quite unconscious confusion, about the powers and responsibilities attaching both to individuals and to appointments is one of the most fruitful sources of waste in economic life. It leads to endless misunderstanding and discussion—discussion which has often no relation to facts, to reality, but only to the use of the same word by various people with different meanings.

In Great Britain the Joint Stock form of business organisation has been imposed upon and has largely superseded the older forms of individual ownership and private partnership. In a great many instances our Limited Liability Companies have not been established *de novo*, but have evolved from one of

the older types, the new legal form being added to the structure of an existing business Under the earlier types of organisation the owner or partners usually carried out themselves many of the executive duties and responsibilities concerned with the control of the business Arrangements for co ordinating their individual activities and for defining their respective functions were often of the loosest They partook of the character of casual understandings arrived at in conversation between friends or relations, rather than of any more businesslike agreement Instances are not wanting in which quite large businesses were conducted by a group of partners without any definite arrangement for regular meetings between them or any formal record of their decisions The same individual in the same morning would take part in a discussion involving issues of the utmost moment for the future policy of the business, and also occupy himself with quite subsidiary details of the executive management

The law governing the constitution of limited liability companies provided for a more precise division of functions The responsibilities of Directors were to some degree defined, and methods of recording the more important decisions as to financial policy were prescribed In cases where such Directors were appointed to the Board from outside the concern, they usually took no part in the executive control, and it became clear that there was a distinction between the more advisory and deliberative duties which they carried out as Directors, *and the actual day-by day management* But in many instances the former partners became Directors of the new company and at the same time continued

their previous participation in the management. Where the two functions were thus combined in a single individual it was often difficult for him to appreciate the distinction between them. The title "Managing Director" did something to clarify the situation.

But it still frequently happens that a Director who is also concerned in the management will assume in the latter capacity powers and responsibilities which properly only belong to him in the former, and which should lapse when the Board is not sitting. This confuses his relations with his colleagues in the management, hampers the establishment of clear-cut lines of authority and responsibility, and introduces opinions as to policy into areas in which they have no place. On the other hand, the proper duties of Directors as Directors tend to be lost sight of. The broad questions of policy over long periods, which should occupy the Board, are crowded out by discussion as to details of management. The objective review of facts, which is essential to wise decisions, is obscured by those minor personal rivalries which inevitably occur among any group of men engaged in the various phases of a complex but integral operation.

It is for these reasons that it is of particular importance to define the activities which properly belong to a Board of Directors and those which form part of the duty of a Manager and are concerned with the executive control of the enterprise. One definition which has been suggested reads: "*Administration* is the function of industry concerned with the determination of the corporate policy, coordination of production, finance and distribution

the settlement of the compass of the organisation and the ultimate control of the executive" Over against this are set the duties of management "*Management* is the function of industry concerned with the carrying out of policy within the limits set up by administration and the employment of the organisation for the particular objects set before it "[1]

In dealing with rationalisation the problems of administration are largely those which arise outside the compass of the concern itself The employer who is anxious to conduct his business efficiently cannot limit his attention to the internal organisation of his own concern Wide and complex as is the field of modern business management as described in the previous section, detailed acquaintance with its developments is but a part of the wider task of conducting business enterprises

Undertakings of all descriptions are not only entities concerned in the successful pursuit of their own ends, they are also units in far wider groupings These groups again are themselves often only constituent elements in still larger organisations These groups and organisations exist for many purposes, some specialised and some general In the relations between these groups and their reaction upon each other are created currents of feeling and opinion which constitute one of the most important features of our economic civilisation Their complexity is constantly increasing But the business man who wishes to steer his enterprise successfully *cannot afford to ignore them*

For instance, it is impossible under modern con-

[1] O Sheldon *Philosophy of Management*

ions for any single concern to ignore the move-
nts and tendencies which express themselves in
rious forms of trade organisation. Up to the end
the nineteenth century, the organisation of
siness men into associations representing particu-
trades, or into associations such as Chambers
Commerce representative of geographical areas,
veloped only slowly. Such forms of combination
rang spontaneously from the need to defend or
promote some special common interest, rather
an from any wider conception of the possibilities
corporate action on a permanent basis.

To-day the position has been substantially modi-
d. The tendency of organisations of workers to
andon their earlier local or craft basis, and to
come fused in large-scale national Trade Unions
many of them covering the whole of the workers
a given trade or industry—has had its counter-
rt in similar national organisations of employers
a trade basis. Chambers of Commerce have been
ked up into national and international associations.
-day there is hardly a single trade in the country,
a single locality, which does not possess its per-
anent machinery for organised co-operation. This
achinery has again been linked up in various ways
certain general or special purposes. For instance,
e majority of Trade Associations in the country
e members of the Confederation of Employers'
ganisations for all purposes of Trade Union
gotiation, and of the Federation of British In-
stries for other general commercial purposes.

Another influence which has contributed largely
this pyramid of inter-locking associations is
e establishment of Trade Boards and of Joint

Industrial Councils in a large number of trades The fringe of more individualistic businesses, which did not prove susceptible to the general tendency towards voluntary co operation, were subjected to definite propaganda, and to a series of motives impelling co operative action

The power of these different types of groups varies within very wide limits In a great many instances it is clear that the discipline which Employers' Associations are able to exercise is weaker than that of the great Trade Unions, a fact which has led to frequent difficulties in the course of negotiations But on the whole the tendency to regard such bodies as limited in their action to negotiating with other bodies too large to be dealt with by a single concern is giving ground to a much wider and more constructive view of their functions and possibilities The development of co operative research under the Department of Scientific and Industrial Research, and also by trades acting independently, has been largely organised and financed by the more advanced sections of the Trade Associations concerned Marketing, export, and many other problems have been handled in this way by one trade or another. It is clear that the administrator must to day include in his purview the whole field of corporate action within his own trade, and the relations involved between that trade and contributory industries, its competitors and its customers

Another subject, wider than the individual concern, which the efficient administrator must keep *before him, is the movement for the simplification* of processes, patterns, and products, and for the adoption of recognised standards in business While

the movement in this direction in Great Britain lags behind the rapid development which has taken place in the United States under the stimulus of Mr. Hoover's secretaryship of the Department of Commerce, and in Germany under the leadership of the Reichskuratorium, it has a long history, and is of outstanding importance in many trades. More particularly in the engineering industries, the work of the British Engineering Standards Association has resulted in the establishment of accepted measurements and forms of contract for a very wide range of manufactured articles, and in a drastic reduction of the number of sizes and patterns in a variety of important instances. Outside this development, important standardisation work has been carried out by the paper-making industry in response to a demand from the Federation of Master Printers. A Committee has recently been established by the President of the Board of Trade to further the development of simplifying and standardising activities throughout Great Britain.

The enormous wastes which result from an undue multiplication of patterns and types of goods under the pressure of competitive salesmanship is as yet imperfectly realised. But employers in many individual instances have made experiments within their own factories which have brought home to them the possibilities of cheapened production where complexity due to this cause can be eliminated.

The effective action in this matter open to the employer acting in isolation has very strict limits. It is inevitable that within the next few years far more serious attempts will be made to realise some

of the possibilities inherent in this movement by forms of corporate action Such action, however, cannot hope for success if it is limited to those groupings of interests on which the majority of our present Trade Associations are based Experience both in Great Britain and in the United States of America has demonstrated that standardisation and simplification can only be applied successfully where *all* the interests involved in a particular trade agree to a common policy That is to say it is essential that not only manufacturers, but the wholesalers, retailers, and consumers, must be associated in any serious effort to realise the economies possible in this direction The wider issues of trade policy which the probability of such forms of co operation suggest must necessarily be the subject of consideration by the business administrator

Important, however, as are the movements towards complete and more constructive trade association, and for standardisation and simplification, it is probable that they do not represent the full limits of the action which will be necessary if British industry is to be successful in maintaining the standard of living of its people It has already been noted that the World Economic Conference took into account the general process of re-organisation and unification which has been applied in Germany since the stabilisation of the mark. This movement, for which the minds of German employers had been to some large degree prepared *by Cartel action before the war, has involved a* degree of concentration of power and of large-scale planning for whole industries not at present

attempted in Great Britain except in the case of the chemical industry.

The German experiment is as yet insufficiently developed for its full possibilities and implications to be assessed. But the technical advantages of this type of large-scale organisation, more particularly in the heavy industries, cannot be questioned. Astonishing economies in the utilisation of the basic sources of power and in their application to industrial purposes have already been registered. In Great Britain the tendency towards marketing associations and other forms of combination in the coal industry, and the present plight of iron and steel and of textiles, suggest the probability that similar intensive experiments in the integration of business activities are inevitable in the near future.

It may be repeated that such experiments do not necessarily involve trusts or combines in the older sense of those terms. While the Rationalisation developments in the chemical industry have taken that form, German experience exhibits other types of combination. More particularly methods have been worked out for uniting central or local Government with commercial interests in the combined control of certain forms of undertakings. Here again the experiments are too new for final conclusions to be drawn from them. But the study of the movements and principles involved is undoubtedly an essential responsibility which must be assumed by the business administrator.

Apart from the tendencies already touched upon which operate within national boundaries, there is a rapid development of both imperial and

international action in the Management field For instance, the Imperial Conference of 1927 passed strong resolutions in favour of measures of standardisation which should establish common practices throughout the British comity of nations

On the side of Distribution, the establishment of the Empire Marketing Board has resulted in drawing an increased public attention to the possibilities of inter-imperial trade More especially it has accomplished valuable educational work in calling the attention of manufacturers, both in Great Britain and in the rest of the Empire, to the special requirements of the various markets involved and the methods of packing and presentation best calculated to satisfy them

Turning to the international field, reference has already been made to the movement for the international study of Scientific Management represented by the International Management Institute (see page 76) Apart from these forms of international co-operation, international agreements in specific industries and between groups of bankers and financiers have increased rapidly in number in the course of the last few years Such agreements deal with de limitation of markets, combined action for the exploitation of technical processes, unified research, and similar matters

Here again are movements and sources of information which the industrial administrator who wishes to maintain his business at the highest pitch of efficiency cannot afford to neglect

It may be doubted whether at present British employers have envisaged the effort which is

required of them on the administrative side if the problems raised by these complex groupings are to be handled with an energy and skill commensurate with their importance. As was pointed out at the beginning of the chapter, the personal habits created by older forms of business organisation have tended to survive into the era of the limited liability company, and to slur the clear-cut division of duties and responsibilities which is essential to successful operation. It is very usual in Great Britain to find people who insist on talking about "the human touch" and "personal difficulties." Definite and systematic organisation is met with a species of resentment. There is an almost historic fear of regimentation. This apprehension even goes so far as to assert itself as a virtue under the guise of "sturdy British individualism." But the personal difficulties which are so frequently pleaded as an obstacle to business reorganisation usually resolve themselves into habitual attitudes evolved to protect some vested interest against the wider interests of the concern viewed as a whole. "The personal touch" upon which many employers pride themselves, is frequently merely a hearty habit of inquiring too intimately about subordinates' private affairs, or a trick of expressing personal inclinations in their official decisions. Indeed, it may even be suggested that in many concerns "the personal touch" is the direct origin of a great deal of personal touchiness.

Much the same is true with regard to the larger organisations in which business concerns unite themselves. Far too little attention is paid by employers both to the organisation and staffing of

their associations and federations Such associations and federations have usually been formed for an object But the object is often the last matter to be considered in their discussions The art of merely keeping the association together against the dead weight of indifference frequently occupies all the time and attention, both of the officials and of the employers who interest themselves in the matter Again, the actual functions of such associations and their relations to each other are seldom worked out systematically Such questions are left to chance or to be smoothed out by the slow action of friction

Probably the greatest source of difficulty of all in this field, however, is the overwhelming suspicion of the business man of any form of State action This, of course, is partly a reaction to the claims of the early State socialists But it is a reaction to bureaucratic rigidity which has gone beyond all reasonable bounds, and inhibits the majority of business men from exercising any reasonable, intellectual judgment in matters where the action of a Government department is concerned Much as a Jack in the Box reacts when you press the spring, so employers of this school of thought react to any suggestion that any action by the State can possibly be beneficial to industry Similarly, they are inclined to neglect or ignore such contributions to knowledge and such assistance in their daily tasks as the State is at present in a position to render effectively

This fixed attitude has two results In the first place there is a very wide dispersal, between different departments of the central Government, of functions

and activities bearing upon industry. The arrangements for keeping the individual employer informed as to the assistance which the State can give him are not very effective. It is ridiculous, for instance, to expect that a man with, say, 500 employees can take in and master each week a *Board of Trade Journal* and *Ministry of Labour Gazette*. On the other hand, both these publications contain information which could be of considerable service to him. But until business men are willing to approach the activities of the central Government in a spirit which, while critical, is also constructive and not destructive, little improvement in such matters is to be anticipated. Without this improvement, on the other hand, the rational utilisation of the country's existing resources of knowledge is impossible.

More important, however, is the fact that the employer's prejudice against State action prevents him from considering objectively schemes for wider co-ordination of national effort. The general tendency of employers' organisations as such is to take the line "see what John is doing and tell him not to." Any initiative taken by an energetic and active minister, whatever his political complexion, is subjected to a type of obstructive criticism which is merely concerned with giving expression to this underlying prejudice, and not with collaborating in any constructive solution of the particular difficulty in question.

It is probably useless to anticipate any united national effort towards a more rationalised conduct of British industry as long as this prejudice persists. As has already been discovered, both by the United

States and by Germany, many of the resources necessary to such an effort are only available to the large departments of State The necessary knowledge and statistical material cannot be mobilised by any smaller authority And in the commercial world any other such authority is bound to have its disinterestedness called in question

It remains to be seen whether within the course of the next few years Great Britain's political or business life will throw up a statesman capable of inspiring the employers of the country sufficiently to overcome this prejudice Failing this the development of rationalisation is bound to be slow The new technical conditions which industry is facing, call for new forms of collaboration. Efficiency, more scientific management in the individual works are much But they are not enough Either from politics or from business must be found a man, or a group of men, capable of evolving and initiating a new approach to the whole complex of the economic life of the country. That, and nothing less, is the larger problem facing Great Britain in the field of administration.

CHAPTER IX

THE PRESENT POSITION IN GREAT BRITAIN

IT is clear from what has been said already that the whole position at the present moment with regard to rationalisation in Great Britain is a confused one. There is little understanding of the term, and the processes by which employers are seeking to apply the conception to their immediate problems are partial and experimental. There exist a very large number of agencies of extremely unequal value which are designed to assist the individual employer in keeping touch with the increasingly rapid development of specialised knowledge bearing upon his task. But the task facing the individual, especially in the smaller business, is almost overwhelming. To survey a tithe of the printed material which is poured out in lectures, conferences and technical periodicals is in itself a task calling for a considerable organisation. The fact that certain of the organisations which compete for the employers' attention are themselves doing work of little value or are distinguished rather by moral enthusiasm than by effective methods, irritates the practical business man who seeks to make use of them. A few adverse experiments tend to confirm him in the impression that nothing of real value to his business is to be gained from such outside agencies, or indeed from theoretical and scientific study of any kind.

On the other hand, the fact that the research work and study bearing directly on Management and Administration is at present little developed compared with the work done in the physical sciences complicates the situation Many businesses which wish to make use of all the information and assistance which can be of practical service to them, are inadequately organised to maintain contact with the sources likely to prove of value

Above all there is lacking a comprehension of the necessity for co ordinating national effort if full effect is to be given to the possibilities of this new economic conception Politicians of all parties bewail our unemployment figures The leaders of industry offer no solution of the unemployment problem, but are quite sure that any action taken by the State which touches upon business activities must necessarily be ineffective Nor is the dilemma which is presented by these attitudes faced frankly It is recorded that at one stage of the Melchett-Turner conversations a leading employer said to a leading trade unionist "Are your men really prepared to work?" The reply came very promptly "Are you really prepared to find them work?" Dialectics are no solution But it seems clear that if any substantial recovery in English business conditions is to be hoped for, it must come from one of two directions Either the leaders of the two main organised forces engaged in industry itself must combine to lead public opinion towards the new forms of organisation and of effort called for by the present situation Or, alternatively, the leaders of industry must put their prejudices in their pockets and allow political leaders, if such can be

found, to assume the responsibility which they have abrogated.

It is not, of course, possible in any old-established country, with its own special traditions and national characteristics, to imitate slavishly systems and methods evolved under dissimilar political and economic conditions. But there is one special feature characteristic both of the American and of the German attempts to improve the national standard of economic activity which deserves more than a passing attention from Great Britain. The novel character of the technique introduced by Mr. Hoover in his standardisation and simplification work at the Department of Commerce has already been emphasised.[1] The initiative in Germany has been expressed in rather a different structure. The National Board for Efficiency (Reichskuratorium für Wirtschaftlichkeit) is not a Department of the State. It is an independent institution with a board representative of the largest business interests in Germany, and also of the best technical knowledge represented by the various existing scientific and professional associations. It is entrusted with the administration of a large proportion of the funds available for business research of all descriptions, including a substantial contribution from the national Government. It does not itself undertake any research work. But it co-ordinates the work which is done, through its power to refuse funds to such undertakings as engage in overlapping activities, or are not producing results of real value to the national industry. In addition, it undertakes the publication of important findings and propaganda in favour

[1] See Chapter III.

of rationalisation Finally, it surveys the whole field of national requirements in matters of technical advice and research, and promotes the creation of the machinery to fill in gaps which it discovers

One of the underlying principles on which it proceeds should make a special appeal to employers in Great Britain Broadly speaking, the German term for it may be translated "team work" (Gemeinschaftarbeit) In effect this conception is a variation of Mr Hoover's practice of securing that the actual work of his Standardisation and Simplification Committees is done by the nominees of the various trade associations concerned Similarly, when in Germany a decision is taken to extend the work of the Reichskuratorium in any particular field, the usual practice is to set up a commission composed of leading business men who have made a special study of that subject Thus, at the moment of writing, over 6,000 important industrialists are giving their time voluntarily to the work of the various commissions of the Reichskuratorium and its affiliated bodies They do this because they believe that it is part of their duty as citizens to assist in the reconstruction of the national economy on the broadest possible lines, and to help their fellow manufacturers to an understanding of the most modern practices in technique and in organisation

Similarly, in the U S A, Mr Hoover has succeeded in enlisting the voluntary service of large numbers of her highly trained business executives

In both countries this situation is in the direct line of succession from practices developed during the war period As in Great Britain, in these

countries also, the leaders of industry gave gladly and freely of their time and services to the national cause. In the United States they were known as the "dollar-a-day men." But, whereas in Great Britain the magnificent services and experience represented by her various wartime departments of supply gave place after the Armistice to an almost indecent haste in returning to an isolated and aggressive individualism, both Germany and America appear to have retained, in dealing with their post-war difficulties, something both of the practical lessons and of the spirit of co-operation of the years 1916–1918.

This is not to say that there was no reaction in these countries, or that the solidarity of a fighting nation was wholly retained. But in both cases there remained some appreciation of the advantages of large-scale industrial organisation and a residue of the practice in integrating industrial and governmental activities that had been obtained. And it must be confessed that they added to these advantages a conception of national welfare conceived in economic terms which still appears to be lacking in Great Britain. There is no question that a large number of the German business men who are serving on the commissions of the Reichskuratorium and its allied bodies, are doing so in the belief that rationalisation offers a definite and practical way of escaping from their economic difficulties, and that it is their duty as citizens, quite apart from their interests as individual traders, to devote their time and their energies to this cause. In the United States the idea of "Prosperity" has something of the same altruistic appeal.

To this Germany adds another advantage As has been pointed out by the writer already quoted,[1] the practice gained by German industrialists in Cartel organisation prior to the war has undoubtedly proved of enormous value in facilitating the readjustments called for by a rationalised consideration of her national industry The control of large scale business combinations, involving a whole series of interlocking and previously independent units, is a task which calls not only for the highest administrative skill, but even more for special experience in uniting conflicting interests in pursuit of a common policy Great progress has been made in Great Britain in the course of the last few years in the partial unification of many of her industries The various experiments in coal marketing and the recently formed cotton corporation, may be cited as examples of this tendency Of a slightly earlier date are the unification of the chemical industry and the amalgamation of the railways But the mere unification of financial control, or the conclusion of joint arrangements for working in a particular field do not of themselves necessarily increase efficiency, unless those who become responsible for the control of the larger units thus formed escape entirely from the habits of mind associated with the direct management of smaller enterprises

While students of scientific management have come to conclusions which are sufficiently well-established as to the principles of organisation which should govern the single company or factory, the problems involved in these larger combinations have not at present been submitted to scientific

[1] Walter Meakin *The New Industrial Revolution.*

study. Where those who succeed to the control of these new combinations have not even studied the scientific principles involved in the management of the small unit, they are apt to indulge in a long series of expensive and futile experiments, before they discover the solution of the special problems of control which are raised by the mere fact of amalgamation.

For instance, immediately ten or twenty companies are combined under a single control, there are obvious possibilities of economy in concentrating the production of certain articles in the most efficient works, in eliminating transport costs, and in creating comparative records of efficiency. But when such obvious economies have been realised there remains a network of questions, upon which depend in the long run the efficient conduct of the combination considered as a unity. There are obvious economies in centralising the buying of such a combination: but, in practice, the degree of control which is to be assumed by the buyer at headquarters, and the amount of initiative which is to be left to the individual units, require the most detailed analysis. What is true of buying is true of selling, advertising, technical research, and, indeed, of all functions of management. There is a constant risk that large-scale organisation will become de-personalised to those who work in it. Then, however enlightened the policies of the leaders, these policies will not be reflected in the attitudes and actions of their subordinate officers. Too rigid a centralisation will result in the development of a bureaucratic spirit, and the display in a more exaggerated form of the worst vices associated with Government departments. It is not sufficiently realised among business

men how frequently such proverbial failings as departmentalism and a tendency to "red tape" are a result of size rather than of the particular form of ownership under which an organisation operates

For all these reasons it is particularly necessary that the full scope of the meaning of rationalisation should be widely appreciated The mere financial combination of businesses, or the wider application of scientific methods of management to existing units of control, can neither of them by themselves contribute effectively towards equipping Great Britain with that reorganised national economy which is essential if she is to retain her place among the industrialised nations If she is to safeguard even the present standard of life of her people, and equip herself to meet the inevitably increasing competition, not only of the United States and of Germany, but of France, Italy, Japan, and the other nations who are entering the field of industrialised production, she must achieve a co ordinated national effort She must be prepared not only to combine her individualised industries from the financial standpoint, to eliminate inefficient producers, and to achieve a finer balance between demand and supply In the management of individual and of combined undertakings, she must not only be prepared to use the most scientific and most modern methods so as to reduce her costs of production, while maintaining and increasing the earnings of her workers She must, in addition, be ready, as she was prepared throughout the latter years of the war, to sacrifice all individual and personal interests and prejudices to the mobilisation of every aspect of her national resources which can aid her in this task

CHAPTER X

SOME SUGGESTIONS FOR ACTION

IF the conception of rationalisation and the general conclusions as to the position of Great Britain which have been expressed in previous chapters are accepted, it is clear that any positive and constructive action demands certain essential changes in our national organisation.

In the first place, the most direct result of the application of scientific standards of thought to our economic problems is to lay considerable emphasis on their essential unity. It is impossible to regard the industrial, commercial and financial activities of any country, of any industry or of any individual undertaking in isolation. Whether considered by trades under such headings as coal, textiles, engineering, and so on, or by functions under such headings as technical research, salesmanship, labour, etc., the various types of action which contribute to the national economy are essentially interlocking portions of one single mechanism. It is a highly complex mechanism. For reasons of convenience in examination and in organisation, it must be broken down into groups of activities, of duties, and of responsibilities. But this analysis for purposes of convenience is in itself fundamentally artificial. And in practical life it tends to the creation of barriers and vested interests which

constantly obscure the wider view which is neces sary if the health of the body economic is to be studied as a whole

It is not to be expected, however, that business men as individuals will escape from the tendency to narrow views, which is the inevitable outcome of a strenuous and competitive life, so long as the State itself perpetuates the illusion of watertight com partments by its own forms of organisation The conception and methods of rationalisation which have been sketched, are applicable not only to economic activities, but to every form of organised action in which men participate And a rational review of the activities assumed by the British Civil Service, as the result of legislation bearing on various aspects of economic life, would certainly not suggest the distribution of duties and respon sibilities between various departments of Govern ment, which at present characterises the structure of our State administration

The only Minister who can in any way be des cribed at present as responsible to the Cabinet for measures affecting the general efficiency of British industry and commerce is the President of the Board of Trade But if this Cabinet Minister should attempt to take anything like a synoptic view of the situation as a whole, he would find himself sadly handicapped The question of the relationships between capital and labour, and the whole complex of influences which they can bring to bear upon efficiency, rests with his colleague at the Ministry of Labour Should he wish to improve the standard of industrial administration or of salesmanship by better dispositions for the training

of future general managers and salesmen, he could only take action through the medium of the Minister for Education. He cannot test the effectiveness of any factory legislation introduced, except through the work of a division of the Home Office. Should he wish to consider the physical condition of those engaged in economic enterprises, and its bearing on production, he must turn to the Ministry of Health. If it is materials and progress in technical research that he wishes to take into his purview, he must rely on a department reporting direct to the Privy Council. Finally, in all that vital sphere which is concerned with the inter-relations between finance and industry, his work must be referred to the Chancellor of the Exchequer, a Minister whose department is primarily concerned with securing economy, and whose accounts are drawn in a form which places the whole emphasis upon annual savings rather than upon the far-sighted exploitation of capital resources.

In short, British Government arrangements in relation to industry are like a factory with sales manager, production manager, labour manager, chief technical engineer, finance manager, and education officer, all working quite separately and happily at their own special tasks, without any executive co-ordination whatever by a general manager. There are, indeed, many factories in Great Britain attempting to work along these extraordinary lines, usually because the managing director is so incapable of delegating authority, and so busy with other preoccupations, that he imagines that the necessary co-ordination of the efforts of his various subordinates can be achieved

at a weekly board meeting But this sort of loose thinking about organisation is, as far as industry is concerned, rapidly giving ground to more precise conceptions It is realised that if administration—which is the determination of policy—and management—the execution of policy—are distinct activities, there must be definite machinery for securing proper co ordination of work at both levels The businesses which lack a full time managing director or general manager in charge of the executive side of their work, grow steadily fewer In the United States they are regarded as an anachronism

It may be urged that in the sphere of Government the issues involved are so widespread, and the task of co-ordination so complex, that it cannot safely be entrusted to any individual Or, alternatively, it may be argued that the Cabinet fulfils the necessary function of co ordinating the work of the various Ministries and that the real responsibility falls upon the Prime Minister These two contentions are in reality mutually destructive If the work is too complex to be entrusted to a single individual Minister, it is ten thousand times too complex to be entrusted to the Prime Minister, who is also finally responsible for almost every other aspect of the national Government What happens in practice is that no effective co ordination takes place at all

This situation is inevitably bound to react on the minds of business men and of civil servants in their approach to all industrial questions Evidence of it is to be found in countless directions The Minister of Education decides to set up a committee on the training of salesmen But you cannot train

men merely to be salesmen. Some salesmen do, or should, grow into sales managers, and a form of education which is suitable for selling is unlikely to be suitable for general management. In the meanwhile, the Empire Marketing Board pursue their own lines of activity on much the same subject.

An important Committee has recently been sitting under the chairmanship of Sir Arthur Balfour. It has collected an enormous amount of valuable material covering almost every function in six of our basic industries. But throughout its reports the same tendency to departmentalism persists. It has considered overseas markets, industrial relations, industrial structure, training and recruitment, standardisation, scientific research, industrial art, statistics of production, costs of production and distribution, over-capitalisation, transport facilities, industrial mobility, industrial fluctuations, and other subjects. Its volumes are a mine of statistics and information bearing on almost every possible aspect of industrial activity except one. And the aspect which is omitted is management, the function of the employer, the cement which should bind the whole structure together and the initiative which should drive it forward. The same is true of a large part of the thought and discussion which is devoted by industrialists themselves to questions of economic reconstruction.

It will remain impossible adequately to inspire the nation with the conception of rationalisation and to apply that conception effectively as the foundation of a greater economic prosperity, until,

as a preliminary, our statesmen are prepared to re-shape the national administration in accord with modern ideas of organisation It is true that much of the virtue of British political life lies in the unwritten character of our constitution and in the elasticity for adjustment, which issues from the fact that our institutions have been a matter of growth rather than of design But characteristics which are a great virtue in relation to constitutional and legislative issues, may be a great handicap in the fields of administration and execution An organisation which has "broadened slowly out from precedent to precedent" is apt to be both top heavy and redundant

Proposals in this direction have been considered by most of the political parties But the weight of tradition, of established authorities, and of normal conservatism, will tell heavily against effective action What is required is a close and careful review of the existing functions of Government with express reference to the possibility of forging an administrative weapon capable of aiding the industry of the country in a movement towards rationalisation Such a review must necessarily include an objective examination of American and German experience

Undoubtedly, a fundamental requirement is the creation of machinery for thought and study applied to the national economy as a whole, and separated from the responsibilities of day by day administration, similar in conception to the Committee of Imperial Defence in relation to military matters Such a body need not necessarily be given any legislative or executive authority But it must be

provided with an adequate staff of highly trained experts and investigators covering every function of industry. It is possible that such a body might be developed out of the advisory functions of the present Department of Scientific and Industrial Research, provided they were very widely extended to include almost all the recognised functions of industry.

One of the first duties of any centralised body which was set up, would be to canalise the contacts between the State and the individual employer, and to ensure that the services and information at the disposal of the great central Departments were presented with a far closer reference to his actual needs and requirements. A wide gap exists between the information and knowledge already available and the capacity of the industrial and commercial manager to make use of them, particularly when he is operating on a small scale. The duty of bridging this gap rests squarely upon the State departments and not upon the individual. In this matter business men have fair ground for criticism against many of the departments. They produce a mass of statistics, of the results of expert investigations, of information about other countries and markets, all of which might be of great use in practice. But they are unattractively presented, arranged with a view to technical precision rather than immediate utility, and are therefore far less used than they should be. The business prejudice against Government action, already examined, is partly responsible for this situation. But the onus of justifying the product to the customer rests upon the manufacturer. In short, the services of the State to

industry are vilely marketed, in the precise sense in which that word has been used in this book

This is not generally true of all State activities In dealing with motorists, for instance, the Ordnance Survey has produced a series of ¼-inch road maps which are unparalleled in any other country in the world Much of the work of explaining administrative devices to the general public is carefully thought out and extremely effective It is in dealing with the employer that the Civil servant seems to lose touch with the realities of the situation

A third direction in which action by the central Government seems to be essential to any national rationalisation programme, is in the matter of standardisation and simplification

The British Engineering Standards Association is the oldest and one of the most effective bodies of its kind in the world But there are certain tendencies and traditions caused by the special circumstances of its growth which greatly handicap it in taking the initiative vis a vis British industry as a whole which is necessary in this question It has established the principle that it will only take action in relation to any trade when formally requested to do so by the proper Trade Association It has hitherto set its face against any publicity It was founded, and is still largely controlled, by the major engineering industries, and has a natural bias in the direction of engineering and affiliated problems

It is possible that the Committee on Standardisation, which has recently been established by the President of the Board of Trade, may succeed in

overcoming these difficulties. But the situation in Great Britain presents a striking contrast to the American picture. There the Department of Commerce has definitely taken a bold line, impressing upon manufacturers by propaganda in the Press, by calling conferences, by making investigations and by publishing their results, the advantages of a national policy of simplification and standardisation. It is only rarely that in any given trade association there is a nucleus of employers with sufficient enthusiasm and disinterestedness to undertake the work of persuading their fellow-manufacturers to embark on a detailed programme of action in these matters. The British Engineering Standards Association waits on the trade organisations; the trade organisations wait for a lead. And the initiative of the State has not hitherto been distinguished by energy and originality.

Undoubtedly, a further pre-requisite to any national scheme of rationalisation is a bold endeavour to co-ordinate the work of the innumerable voluntary associations of a technical, professional or social character, which deal with the many specialised functions of industry. What is true of the dispersed action of the various Government departments and its effect upon a manufacturer is equally true of the multiplication of these agencies of a voluntary character. No business man properly occupied with his own affairs has time or energy to devote to even a small percentage of the activities of these agencies. And only the largest organisations can afford specialists competent to keep in touch with them, and to interpret their findings for the benefit of a particular concern. What happens in practice is

that the busy employer "takes up" one or two special institutions and devotes something of his time and energy to them The usual effect on his business is that the particular aspect of industrial organisation with which these institutions are concerned has an importance which is out of proportion to the whole Psychology, or costing, or market research, or welfare, or chemical research, as the case may be, becomes the hobby of the chief executive, and ceases to be merely one factor in a balanced scheme

To the product of the remaining 95 per cent of institutions he remains indifferent, though, from time to time, there may be a change in the particular object of his personal enthusiasm

As a consequence, all these organisations compete with each other for the support of the most enlightened employers Many of them are inadequately financed Some of them should, undoubtedly, be combined with others There is much overlapping and waste Almost invariably their information and services are, as is the case with Government departments, badly marketed, and far less effective than they should be

It is possible that a comprehensive organisation, co ordinating all these institutions on the German model, is not applicable to British conditions But it is clear that the present situation is wasteful of both resources and opportunities Some method of co ordinating the activity of the large number of organisations already in existence, of directing the attention of employers to work likely to prove of real value to them, of protecting genuine workers in this field from the competition of charlatans and

unpractical enthusiasts, is an urgent requirement of national economic policy. In this direction, also, the national Government might possibly give a useful lead. But on the whole, in view of British national tendencies and traditions, it seems probable that the more effective machinery could be designed by industry itself. The Committee mentioned in the Preface to this book represents a first attempt to obtain co-operation and co-ordinated action between a large number of different organisations bearing in greater or less degree upon the problem of industrial management. It is suggested that employers themselves, in the interests alike of the organisations concerned and of business as a whole, should insist that this work be carried through, and that the present dispersal of effort should be abolished.

If a hundred leading employers would agree together to refuse to contribute to any institution which did not lend itself to a scheme of co-ordinated effort, it would probably be all that was necessary to secure that the whole of this work was done in a far more rational and less wasteful manner.

For the study of the actual problems of management and administration themselves there is at present little effective machinery in existence. The Management Research Group Movement, described in an earlier chapter, has made considerable progress. But it is young, limited in resources, and has constantly to battle against the idea that frank discussion of managerial and administrative methods involves the disclosure of valuable business secrets. In this field Great Britain is considerably behind the majority of European countries, and even more

behind the United States of America Few of her leading industrialists appear to interest themselves seriously in the matter Many of those who do, adopt the somewhat curious attitude that it is bad policy to allow their executives to write and speak about the professional problems which interest them Great Britain's participation in international action in this field, and in the various congresses which have been held in Europe on the subject of Scientific Management, has been deplorably feeble It must be recognised that, if this attitude continues, it is probable, not only that her standard of managerial efficiency will cease to compare favourably with that in other countries, but that her business leaders will lack the necessary knowledge of modern management technique, of its terms and of its attitude of mind, to enable them to participate effectively in discussions bearing on these points with the industrialists of other countries Since the wider aspects and development of rationalisation undoubtedly point to a great extension of international agreements relating not only to markets but to the closer collaboration of whole industries on an international scale, it is probable that the future effect of this conservatism may be extremely deplorable

Closely associated with this question is, of course, that of education for business management The provision of educational facilities bearing directly on the task of business management is undoubtedly inadequate so far as Great Britain is concerned In the year 1926 there were in the United States over 80,000 students receiving instruction of University standard in business administration In

Germany there were 16,000. In Great Britain there were less than 1,000.

In many of the modern Universities there are degrees in Commerce. But the syllabuses leading to such degrees and the instruction provided suffer from two weaknesses. Direct contact with business and with the material provided by actual business operations is frequently lacking. For this reason the contents of the courses tend to be predominantly academic and technical. The subjects selected for examination do indeed bear on the general problem of Management, but only in the sense that the technical needs of engineering may be said to bear upon the subject of Management. The teaching of accountancy, of commercial geography, of company law, of Trade Union history, of industrial psychology, and similar subjects in isolation, does not prepare the pupil's mind for the responsibilities of Management. What is needed is more attention to the co-ordination of these courses and greater emphasis on the general problems of administration. In practical life the Manager is not presented with separate problems in accountancy, engineering, psychology, and the like. He is presented with definite situations which call for the integrated application of some knowledge of all these techniques.

The use of more and better machinery for instruction of those who are likely to have to assume the responsibilities of industrial control is one of the steps necessary if employers are to understand and to use the conceptions of Rationalisation.

CHAPTER XI

CONCLUSION

THE conception of Rationalisation which has been urged throughout this book is that summarised in F W Taylor's phrase "a mental revolution" That phrase he applied expressly to Scientific Management "Scientific Management," as the term has been used in Europe, is a vital part of the general movement of thought and the development of new methods which we have come to call Rationalisation But it is applied rather to the control of the individual works or company Rationalisation looks at the wider problems of industry as a whole, including the more detailed field of scientific management But each conception is essential to the other, and no industry can be said to be rationalised unless its detailed management has been subjected to the closest scientific analysis and the application of the most modern practices

It is not probable that this new conception will be wholly accepted either by employers or by employed without a long struggle F W Taylor frequently emphasised the added responsibility which the employer must assume, if he accepted his principles No one likes added responsibility it is much easier to continue in the old ways The immediate insecurity, which is the deepest apprehension of the individual worker under modern industrial con-

ditions, is increased during any process of change and re-organisation. Considerations of immediate self-interest force him, therefore, to view such periods of change with suspicion and dislike. It is hard to convince a man who is paid by the hour or the week, and whose whole outlook on life is necessarily coloured by this short-period assurance of income, to embrace gladly a policy which is designed to work out over those longer periods which are the real measure of permanent economic change.

On the other hand, the leaders of labour have undoubtedly shown a broadmindedness and statesmanship in relation to rationalisation, which is a very happy augury for the future. They have, indeed, been far more willing to view the new conception objectively and carefully, if not with favour, than the majority of employers. Indeed, there is much in the policy of rationalisation which accords closely with the wider ideals of the organised labour movement.

But whatever the immediate interests of groups and parties in the industrial world, no serious citizen can question the urgent need of an ever-rising standard of national efficiency. Modern scientific developments have presented a wide range of alternatives both in processes and in products, which have gone a long way to eliminate any natural advantages formerly enjoyed by particular industrial communities. The standard of living of the population of all great industrial countries will, in future, depend to an ever-increasing degree on the technical, and above all on the administrative, efficiency, developed by the leaders of industry. The future is bound to be one of increasingly active competition

both within and between nations, a competition which will in itself be healthy if directed and subordinated to the wider purposes for which industry exists But the relative strength and prosperity of the different industrial and national groups will be determined to an overwhelming degree by the flexibility with which they can adapt themselves to an ever-widening range of technical development and of scientific knowledge

APPENDIX A

ECONOMIC CONFERENCE, GENEVA, 1927

RESOLUTION ADOPTED BY THE COMMITTEE ON INDUSTRY, MAY 17TH.

RATIONALISATION

"WHEREAS the rational organisation of production and distribution is one of the principal factors in increasing output, improving conditions of labour, and reducing costs of production:

And whereas such rationalisation aims simultaneously at:

1.—Securing the maximum efficiency of labour with the minimum of effort;

2.—Facilitating by a reduction in the variety of different patterns (where such variety has no obvious advantage), research into methods of manufacture, the use and replacement of standardising parts;

3.—Eliminating waste of raw materials and power;

4.—Simplifying the distribution of commodities by:

5.—Eliminating unnecessary transport, excessive financial burdens, and the useless multiplication of middlemen:

And whereas the judicious and constant application of this process of rationalisation is calculated to secure:

1.—To the community greater stability and a higher standard of life;

2.—To the consumer lower prices and goods more carefully adapted to his needs;

3.—To the various categories of producers, larger and more certain remuneration to be fairly distributed among them

And whereas rationalisation must be applied with the care necessary to prevent injury to the legitimate interests of the workers, and suitable measures must be taken, which do not impede the process in cases where it, in the early stages, may involve unemployment or more arduous conditions of work

And whereas rationalisation requires, in all that concerns the organisation of labour in the strict sense of the term, the co operation of the employees and the assistance of professional and industrial organisations and of scientific and technical experts

The International Economic Conference recommends that Governments, public institutions, professional and industrial organisations, and the general public should

1.—Influence producers to direct their efforts along the channels described above, and in particular that they should

(*a*) Encourage and promote in every possible way the ascertainment and comparison of the most efficient methods and the most practical processes for rationalisation and scientific management and of their economic and social effects,

(*b*) Apply this process in industry, agriculture, trade, and finance, not merely to large scale undertakings, but also to medium size and small undertakings, and eventually craftsmen and tradesmen, bearing in mind the useful results it is likely to have in the organisation and the requirements of domestic life,

(*c*) Direct special attention to suitable measures for ensuring the best, healthiest, and most dignified employment of labour, such as occupational selection, guidance and training, the distribution of labour and leisure, methods of remuneration which give the worker a fair share in any increase in output, and, in

general, conditions of labour and living favourable to the development and the strengthening of his personality;

2.—Carry on systematically, on an international as well as on a national scale, the standardisation of materials, parts, and products for all types of goods of international importance in order to remove the obstacles to production and trade that might arise from a policy of purely national standardisation;

3.—Undertake investigations on an international scale with a view to ascertaining the best methods employed and the most conclusive results obtained in every country in the application of the principles set forth above making use of the investigation already carried out in certain countries, and encourage the exchange of information among those concerned;

4.—And diffuse in every quarter a clear understanding of the advantages and obligations involved by rationalisation and scientific management, and of the possibilities of their gradual application."

APPENDIX B

SOME DEFINITIONS OF RATIONALISATION

World Economic Conference

'Rationalisation, by which we understand the methods of technique and of organisation designed to secure the minimum waste of either effort or material They include the scientific organisation of labour, standardisation of both materials and products simplification of processes, and improvements in the system of transport and marketing"

Reichskuratorium für Wirtschaftlichkeit (Board of National Efficiency)

'Rationalisation consists in understanding and applying every means of improving the general economic situation through technical and systematic organisation Its object is an increase in the standard of living by the provision of better and cheaper goods in larger quantities This demands a common effort by all classes of the community"

Lord Melchett

"The first thing rationalisation ought to aim at is a closer approximation between production and consumption Unless you know fairly accurately what any country's production of a commodity is going to be, you cannot get that rationalisation of production and consumption that is required for economic prosperity"

Sir Arthur Balfour

"The method of technique and organisation designed to secure a minimum amount of waste of effort and material, together with scientific organisation of labour. careful

standardisation of materials and products, and simplification of processes, and, finally, improvement in the system of transport and marketing."

Professor D. H. Macgregor :

"The right organisation of industry considered as a type of government, the producers being so related as to enable such policies to be applied as works specialisation, non-destructive elimination of the weak, and the control over the entrance of new establishments."

Sir Josiah Stamp :

In discussing the subject almost entirely in terms of amalgamations and price-fixing, and referring to the Armstrong-Vickers fusion, he writes: "It does indicate, however, a different kind of amalgamation, viz., the separation of those which are functionally different, and the joining, or rationalisation, of those that are really most alike in their activities."

Sir Gilbert Vyle :

"The conduct of industry in such a way that the price of its products was fixed, and by the aid of whole or part monopoly the agreed selling price was maintained without relation to costs of production. The condition essential to successful rationalisation was the absence of competition, and, as all of them were consumers, it was proper to inquire whether such a method of systematising industries was a good thing for the community as a whole."

Robert Boothby, M.P. :

"The conscious control of the production and development of industry."

The Rt. Hon. Philip Snowden, M.P. :

"Rationalisation aims at such a reorganisation of industry as will eliminate all waste in production and distribution, and will utilise, to the full, mechanical and scientific knowledge, and secure the co-operation of all the essential partners in industry."

W L Hichens

' The amalgamation of firms doing a similar kind of business with the object of promoting efficiency and economy "

Messrs Donovan and Webster (Assistants to the Attorney General, U S A)

" The word rationalisation is indiscriminately applied to various firms of large scale European business combinations In essence, the word stands for joint action to accomplish specific business purposes and the usage, of course, is misleading Because combinations are useful and form economical expedients, it is now thought that they are part of the eternal order of nature—hence rational

" The use of a single word to describe a highly complex situation is another unfortunate result It satisfies the lazy mind and precludes equitable analysis and clear thought It is not sufficient merely to say that rationalisation represents simplification, standardisation and stabilisation The truth is, business enterprise may be ' rationalised ' and at the same time take the form of a trust, a syndicate, a monopoly, a concern or a mere corporation "

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Yours
Edwin Hart
Thos L

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